

# Recycling-Based Waste Management Action Plan for the Communities of Sullivan County, NH



**Antioch New England Institute,  
Antioch University New England Keene, NH**

**February 2007**

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**Prepared by Antioch New England Institute,  
Antioch University New England, Keene, NH**

**with funding from the  
U.S. Department of Agriculture**

**February 2007**

**Note from Katie Lajoie, November 2011:** This online version makes corrections to the print version:

\*Page 5: Susan Lawrence's residence corrected to read *Unity*

\*Page 45: Estimate for household hazardous waste corrected to read *one-quarter to one percent* of the waste stream; footnote 57 corrected to read *based on an average of 0.6%*

\*Page 86: Row G under "Rutland County, VT" corrected to read *\$230,000*

\*Titles for attachments, tables, and figures adjusted as needed to be consistent throughout report

## **About Antioch New England Institute**

Antioch New England Institute (ANEI) is a nonprofit consulting and community outreach arm of Antioch University New England. ANEI promotes a vibrant and sustainable environment, economy, and society by encouraging informed civic engagement. ANEI works with local communities, regions, states, and other public or not-for-profit organizations to develop sustainable, citizen-based solutions. Since its inception in 1994, ANEI has provided training, programs and resources in leadership development, place-based education, nonprofit management, environmental education and policy, smart growth and public administration both in the U.S. and overseas.

Antioch University New England (ANE) is one of five campuses of Antioch University. Established in 1964, ANE is an innovative institution offering scholarly, practice-oriented graduate study in environmental studies, organization and management, education, and applied and clinical psychology. ANE emphasizes interdisciplinary and participatory teaching, student field work integrated with academic instruction, and training in leadership and management.

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\* Please note that inclusion on the list of names does not imply endorsement or support of specific recommendations included in the Action Plan. Rather, ANEI's intent is to thank those listed above for their participation in some way, shape, or form.

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ANEI also wishes to acknowledge RCAP Solutions, a non-profit community development organization based in Massachusetts, which assisted in establishing the Waste Action Collaborative of Sullivan County. RCAP's participation in the project was funded by the U.S. Environmental Protection Agency under its CARE program.

Without the help of all these individuals, this plan would not have been possible. Many, many thanks.

Paul Markowitz, Project Director  
Antioch New England Institute  
February 2007

## List of Acronyms

ANEI	Antioch New England Institute
C&D	Construction and demolition debris
GAT	Guaranteed annual tonnage
HHW	Household hazardous waste
ILSR	Institute for Local Self-Reliance
MRF	Materials recovery facility
MSW	Municipal solid waste
NH DES	New Hampshire Department of Environmental Services
NRRA	Northeast Resource Recovery Association
PAYT	Pay-as-you-throw
SCRRDD	Sullivan County Regional Refuse Disposal District
SWIP	Solid Waste Implementation Plan
TS	Transfer Station
WACSC	Waste Action Collaborative of Sullivan County

## Executive Summary

This *Recycling-Based Waste Management Action Plan for the Communities of Sullivan County, NH* (Action Plan) is designed to help Sullivan County residents realign waste management priorities toward a recycling-based and resource conservation based economy. The Action Plan emphasizes reducing the volume and toxicity of waste through recycling, waste reduction, reuse, composting, proper management of household hazardous waste, and effective management of residuals. It is based upon the concept of “Zero Waste,” wherein “waste” is viewed as a potential resource. A “Zero Waste” approach requires that we maximize our existing recycling and reuse efforts, while ensuring that products are designed for the environment and have the potential to be repaired, reused, or recycled.

Sullivan County has enormous potential for shifting its waste management practices away from incineration and landfilling and toward waste reduction and recycling. Currently, Sullivan County towns recycle only 13% of their waste -- far below the State of New Hampshire recycling goal of 40% by the year 2000, and far below recycling levels achieved by numerous New Hampshire towns. Sullivan County towns could reduce their current annual waste disposal bill by over \$1,000,000 by increasing recycling levels in their communities to 50%.

This Action Plan is the culmination of efforts by dozens of local residents to move Sullivan County toward a more recycling-based economy. All decisions on management systems have been guided by a public Steering Committee under the framework of the Waste Action Collaborative of Sullivan County (WACSC). Towns included within the scope of this action plan are: Acworth, Charlestown, City of Claremont, Cornish, Croydon, Goshen, Grantham, Langdon, Lempster, Newport, Plainfield, Springfield, Sunapee, Unity, and Washington.

Most Sullivan County residents pay among the highest tipping fees in New Hampshire and across the nation at \$91/ton, while tipping fees at some landfills in the region are less than half that amount. Combined with the relatively low median household income, Sullivan County residents pay a disproportionate share of their income for waste disposal. Residents and businesses have the option of disposing of their solid waste and recyclable materials through an extensive network of drop-off facilities. Private waste haulers provide some curbside collection of municipal solid waste, with virtually no curbside collection of recyclable materials. Several Claremont companies process metals and cardboard for recycling. Overall, the infrastructure for existing recycling infrastructure is relatively limited.

While Sullivan County residents dispose of an estimated 27,000 tons annually, the U.S. Environmental Protection Agency estimates that approximately 75% of this waste could be recycled or composted. Accordingly, the Steering Committee of the WACSC established a 50% recycling goal within five years as something that is both attainable and desirable. ANEI hired a consultant to determine the most cost-effective approaches to achieving the 50% recycling goal. The recycling analysis identifies how much of each waste material could be diverted from disposal, and it includes a set of programs for managing various waste resources. The Action Plan proposes the following new programs and facilities for Sullivan County:



- **Waste reduction:** Undertake an extensive public education and outreach program to educate residents and businesses on how to reduce waste at the source and to expand opportunities for reuse.
- **Recyclable materials:** Maintain the existing network of transfer stations and recycling centers in Sullivan County. Institute curbside recycling in areas that are currently served by curbside waste collection, particularly Claremont, Newport, and Charlestown. Construct a new, centrally-located materials recovery facility in the County.
- **Organic materials:** Provide incentives and technical support for backyard composting. Construct a new aerated windrow composting facility to compost yard and food waste. Initiate pilot curbside food waste collection programs for restaurants and schools in Claremont and Newport. Provide seasonal curbside collection of yard wastes.
- **Construction and demolition debris:** Promote on-site source separation programs for new construction and renovations. Promote deconstruction programs for building demolition. Support the establishment of a new business or non-profit organization to sell reused building materials.
- **Household hazardous waste (HHW) and universal wastes:** Promote widespread public education programs to encourage alternatives and proper disposal. Establish a new permanent HHW facility and roving vehicle to serve the outlying/rural areas.
- **Residual material:** Construct a new, centralized transfer facility with the ability to consolidate waste materials for long-haul, out-of-county disposal. Contract with an out-of-county disposal facility to accept residual materials from Sullivan County towns.

Sullivan County towns will need to implement a range of policy initiatives, make investments, and stimulate behavioral change among its citizens to achieve a 50% recycling rate within the next five years. ANEI proposes the following recommendations to move Sullivan County down this path, as detailed below.

- **Local governments should declare waste reduction and recycling as waste management priorities:** Both the general public and the private sector need to know that local government officials are serious in their intent and commitment to making recycling a reality in Sullivan County.
- **Make recycling convenient by instituting curbside recycling collection:** Studies nationwide have shown that convenience is one of the most important factors in getting people to recycle. Sullivan County towns can significantly increase recycling by ensuring that all residents currently served by curbside waste collection also receive curbside collection of recyclable materials.

- ***Provide economic incentives for residents and businesses to recycle:*** Most residents in Sullivan County have very little incentive to recycle or reduce their waste because their disposal costs are paid through property taxes or as a flat fee. Communities throughout New Hampshire and the U.S. have found that a “pay-as-you-throw (PAYT)” program provides customers with economic incentives to reduce their waste, e.g. the less you generate – the less you pay. Further, PAYT is the most equitable way to pay for waste.
- ***Develop the necessary infrastructure:*** Sullivan County needs new infrastructure if it is going to increase recycling levels. Proposed facilities include: a materials recovery facility (MRF), a windrow composting facility, a HHW collection facility, a transfer station for consolidating waste, and a reused building supply center.
- ***Undertake wide scale public education efforts:*** Public education is the underpinning of any successful recycling program. These educational efforts should be diverse, widespread, and ongoing.
- ***Eliminate economic disincentives:*** Towns should not be financially penalized for reducing their waste through recycling. Any new waste disposal contracts should not include guaranteed annual tonnage (GAT) provisions.
- ***Work in partnership with the private sector:*** In all likelihood, the private sector will play a significant role in a new recycling-based waste management system. Local governments should work closely with the private sector to share their vision on waste management for the county and how the private sector can play a role in achieving that vision.
- ***Consider job creation impacts of recycling:*** On a per-ton basis, sorting and processing recyclables sustains ten times more jobs than landfilling or incineration. Towns should consider the job creation impacts of recycling and waste reduction efforts when implementing a new recycling-based waste management system.
- ***Explore range of options on how to finance the system:*** While recycling can save businesses and residences money, it also costs money. In terms of capital requirements for new facilities, such as the MRF, towns will need to evaluate a range of options for raising capital, including bonding, state appropriations, and private sector financing.
- ***Establish new organizational structure for addressing solid waste:*** ANEI firmly believes that a new organizational structure is needed for addressing solid waste issues on a regional basis within Sullivan County, especially given the history of the Sullivan County Regional Refuse Disposal District. Sullivan County communities can benefit by coordinating their efforts to achieve economies of scale and realize cost-effective options for managing waste.
- ***Consider issue of flow control and associated risks for municipal investments in solid waste:*** Any new infrastructure investments, such as a new MRF, could potentially be operating in a market economy wherein private haulers would be free to decide where

they are going to take their materials. Any proposal to publicly-fund a new recycling facility should take this risk into consideration.

With this Action Plan as a starting point, ANEI is hopeful that Sullivan County can be a model of how to transition from waste management practices that emphasize disposal/incineration to programs that emphasizes reducing both the volume and toxicity of waste.

## Introduction

In October 2005, Antioch New England Institute (ANEI), the community consulting arm of Antioch University New England (Keene, NH), received a grant from the U.S. Department of Agriculture to help communities in Sullivan County, New Hampshire develop and implement a recycling-based, integrated solid waste management plan.

Sullivan County is in a unique position to explore innovative approaches to managing solid waste. The contract between the Wheelabrator Claremont Company – owner of the local waste incineration facility -- and the Sullivan County Regional Refuse Disposal District expires in July 2007. Sullivan County residents pay a disproportionate share of their income for waste disposal as they have historically paid among the highest tipping fees in the nation.

Sullivan County has a highly motivated citizenry and elected officials who are ready to move forward with a sustainable, recycling-based waste management program. In February 2004, representatives from Sullivan County communities joined together to form the Sullivan County Solid Waste Alternatives Committee to develop an environmentally safe and economically sound resource management program for Sullivan County. The Committee included public officials, recycling experts, business owners, educators, health care professionals, financial analysts, public administrators, environmental advocates, and other concerned citizens from Sullivan County and surrounding towns. Subsequently, the Committee sponsored four public forums to educate residents and solicit their ideas on how the region should manage resources in the future.

This Action Plan is the culmination of efforts by dozens of local residents to move Sullivan County toward a more recycling-based economy. The plan emphasizes reducing the volume and toxicity of waste through recycling, waste reduction, reuse, composting, proper management of household hazardous waste, and effective management of residuals. This plan is designed to maximize job creation opportunities through collection, processing, and potential re-manufacturing of recyclable materials.

ANEI, in cooperation with RCAP Solutions, established a citizen-based Steering Committee under the auspices of the Waste Action Collaborative of Sullivan County (WACSC) to help oversee effective completion of all project activities. RCAP Solutions, a non-profit community development organization, received a grant under the U.S. Environmental Protection Agency CARE program to reduce the toxic component of the waste stream in Sullivan County.

The Steering Committee met nine times over the period October 2005 – October 2006. (See Attachments A and B: *Steering Committee Agendas* and *List of Steering Committee Members*, respectively.) ANEI also formed a broader-based Advisory Committee to provide project guidance on key issues and preferred management options.

The following activities were undertaken that contributed to the preparation of this document:

- Conducted a recycling survey of Sullivan County residents during March 2006 town meeting. Residents in seven of the fifteen communities completed over 350 surveys.

- Provided technical assistance to Sullivan County communities on recycling, composting, and waste reduction options through a contract with the Northeast Resource Recovery Association (NRRA). NRRA conducted on-site assessments of 12 recycling facilities and transfer stations in Sullivan County and provided written recommendations to facility managers on how to improve and expand their programs.
- In cooperation with RCAP Solutions, awarded a total of \$13,715 in pilot recycling grants to four local governments and one school in Sullivan County. Grants funded projects which improved electronics recycling, expanded municipal recycling collection programs, and implemented pilot curbside programs.
- Conducted an analysis of alternative solid waste systems to evaluate the most cost-efficient and effective waste management approaches for Sullivan County. This analysis serves as the foundation for some of the recommendations in the recycling-based waste management plan.
- Provided technical assistance and information to a NH legislative study committee exploring the possibility of constructing a materials recovery facility in Sullivan County.
- Solicited bids from out-of-county waste disposal sites to explore the availability, price, and terms for sending municipal solid waste (MSW) from Sullivan County communities.
- Held a Recycling Fair to raise awareness about recycling and solid waste issues in Sullivan County.

The following chapters provide an overview of the current solid waste situation in Sullivan County, a description of the proposed recycling-based waste management system, and recommendations on how to move forward.

## Chapter 1: Where We Are Now

### Current Solid Waste Situation in Sullivan County

#### Background

Sullivan County is situated in southwest New Hampshire along the Vermont border. The County is comprised of 14 rural towns plus the City of Claremont -- which is the economic hub of the region. In 2005, the total population of the County was approximately 43,000 – up from 40,500 in the year 2000. Sullivan County is among the poorer regions of New Hampshire with a median household income of just under \$41,000, while New Hampshire’s median household income is \$55,000.

Twelve (12) of 15 municipalities in Sullivan County are part of a bi-state (Vermont and New Hampshire) group of 29 towns that are under long-term contracts to supply trash to the Wheelabrator solid waste incineration facility located in Claremont. Residents in these communities pay among the highest tipping fees in New Hampshire and across the nation at \$91/ton, while tipping fees at some landfills in New Hampshire are less than half that amount. Combined with the relatively low median household income, Sullivan County residents pay a disproportionate share of their income for waste disposal. Historically, the long-term “put or pay contract” between the Sullivan County Regional Refuse Disposal District and the incineration facility has impeded waste reduction and recycling activities by requiring payment for waste services even if waste is not delivered to the incinerator.

Sullivan County residents have a huge incentive to recycle to reduce the quantities of waste being sent to the incinerator. However, unlike their counterparts in Vermont, New Hampshire municipalities receive little support and guidance from the state and have relied primarily on volunteer efforts to implement recycling programs. Further, the incinerator contributes significant quantities of air pollutants to neighboring communities. For example, from 1987-2002, the incinerator emitted approximately 67 tons of particulate matter, 2600 tons of nitrous oxides, 650 tons of sulfur dioxide, and 3000 pounds of mercury.<sup>1</sup>

This *Recycling-Based Waste Management Action Plan* is designed to help Sullivan County residents realign waste management priorities toward a recycling-based and resource conservation based economy. We are hopeful that Sullivan County can be a model of how to transition from waste management practices that emphasize incineration and disposal to one that emphasizes reducing both the volume and toxicity of waste. Towns included within the scope of this action plan are: Acworth, Charlestown, City of Claremont, Cornish, Croydon, Goshen, Grantham, Langdon, Lempster, Newport, Plainfield, Springfield, Sunapee, Unity, and Washington.

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<sup>1</sup> Working on Waste. (2003). *Analysis of Air Emissions: Wheelabrator Claremont Company Incinerator, 1987-2002*. Working on Waste: Claremont, NH. Working on Waste analyzed emissions data on file with the New Hampshire Air Resources Division (ARD), Department of Environmental Services. See stack testing conducted by Almega (1987), Entropy (1987, 1993, 1995, 1998) and Deeco (2000). Also see (1) 1994-2001 *Emission Based Fees Invoice* prepared by ARD, and (2) 1987-2002 *Excess Emissions Reports* submitted to ARD by Wheelabrator.

## **New Hampshire State Law on Solid Waste**

New Hampshire state law provides a strong foundation for this Action Plan. Under Chapter 149-M, each town:

- is responsible for continued and on-going planning for solid waste management within its boundaries;
- shall participate in planning efforts – either as a town or a part of a solid waste management district;
- shall prepare and maintain an “approvable” solid waste management plan; and,
- shall provide a facility or assure access to another approved solid waste facility for its residents.

Chapter 149-M also states that the goal of the State of New Hampshire is to achieve a 40% minimum diversion of solid waste that is either landfilled or incinerated by the year 2000. This diversion is to be achieved through recycling, source reduction, reuse, or composting. Further, the law states that the disposal of recyclable materials in landfills or processing of recyclable materials in incinerators is discouraged.

## **Waste Generation, Diversion, and Composition**

### **Waste Generation and Diversion**

It is estimated that Sullivan County towns generated an estimated 30,972 tons of municipal solid waste in 2005. Of this amount, approximately 27,080 tons were discarded in either waste incinerators or landfills, while an estimated 3,892 tons were recycled. This means that Sullivan County towns recycled only an estimated 13% of their waste in 2005 – far below the year 2000 recycling goal of 40% set by the New Hampshire State Legislature (see above). This recycling level is also far below the recycling levels achieved by several New Hampshire towns, including: Peterborough – 78%, Troy – 54%, and Dublin – 49%.<sup>2</sup> Actually, several Sullivan County towns have achieved respectable recycling levels over 30%, including Unity, Washington, Sunapee, and Acworth. However, low recycling levels in the population centers of Claremont and Newport bring the average recycling rate for the County down. (See Table 1 below: *Municipal Solid Waste Generation and Recycling Rates for Sullivan County, NH.*)

As Sullivan County’s population and per capita waste generation are expected to increase over the next 20 years, total waste generation is expected to increase from the current 30,874 tons to a projected total of 45,513 tons in 2025<sup>3</sup>. Based upon current waste management programs, the vast majority of this waste will end up in landfills or incinerators if Sullivan County does not take aggressive action to implement recycling and other waste diversion programs. (See Figure 1 below: *Projections of Municipal Solid Waste Generation for Sullivan County.*)

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<sup>2</sup> “Recycling and Waste Generation Tonnages,” August 2006. New Hampshire Department of Environmental Services, Concord, NH. [www.des.state.nh.us](http://www.des.state.nh.us).

<sup>3</sup> Based upon an estimated annual increase in population of 1.2%. From projections provided by New Hampshire Office of Energy and Planning [www.nh.gov/oep/programs/DataCenter/Population/PopulationProjections](http://www.nh.gov/oep/programs/DataCenter/Population/PopulationProjections). Also assumes increase in per capita waste generation of 1% annually.

**Table 1: Municipal Solid Waste Generation and Recycling Rates for Sullivan County, NH**  
(2005 data unless otherwise noted)<sup>4</sup>

	<b>Population<sup>5</sup> (estimated)</b>	<b>MSW tonnage<sup>6</sup></b>	<b>Recycling tonnage<sup>7,8</sup></b>	<b>% diversion rate<sup>9</sup></b>
Acworth	880	280	128	31%
Charlestown	5,010	2,528	469	16%
Claremont	13,290	13,445	1,021 (2003 data)	7%
Cornish	1,750	540	116	18%
Croydon	760	268	70 <sup>10</sup>	12%
Goshen	810	334	86	21%
Grantham	2,410	1,282	190	15%
Langdon	630	349	42 <sup>11</sup>	8%
Lempster	1,060	589	139	19%
Newport	6,440	4,215	339 (2003 data)	7%
Plainfield	2,440	910	266 <sup>12</sup>	22%
Sunapee & Springfield	4,290	1731	777	31%
Unity	1,960	169	75 (2004)	31%
Washington	1,670	430	216	32%
<b>Totals</b>	<b>43,400</b>	<b>27,070 tons</b>	<b>3,892 tons</b>	<b>13%</b>

<sup>4</sup> Data based principally on report, "Recycling and Waste Generation Tonnages," August 2006. New Hampshire Department of Environmental Services, except where otherwise noted. Other data compiled by Colleen Osburn and modified by Mary Delahanty, Antioch New England Institute, November 2005.

<sup>5</sup> Population estimates provided by NH Office of Energy and Planning, Concord, NH.

<sup>6</sup> Municipal solid waste quantities do not include construction and demolition (C&D) debris

<sup>7</sup> Recycling totals include containers, fiber, glass, propane tanks, scrap metal, textiles

<sup>8</sup> Recycling tonnage estimates from 2005 Facility Reports submitted by towns to NH Dept. of Environmental Services, except: Claremont from 2003 Facility Report, Newport from study by Morgan Environmental Solutions, LLC, and Plainfield from 2005 town report

<sup>9</sup> tons recycling/(tons residential MSW+ tons recycling)

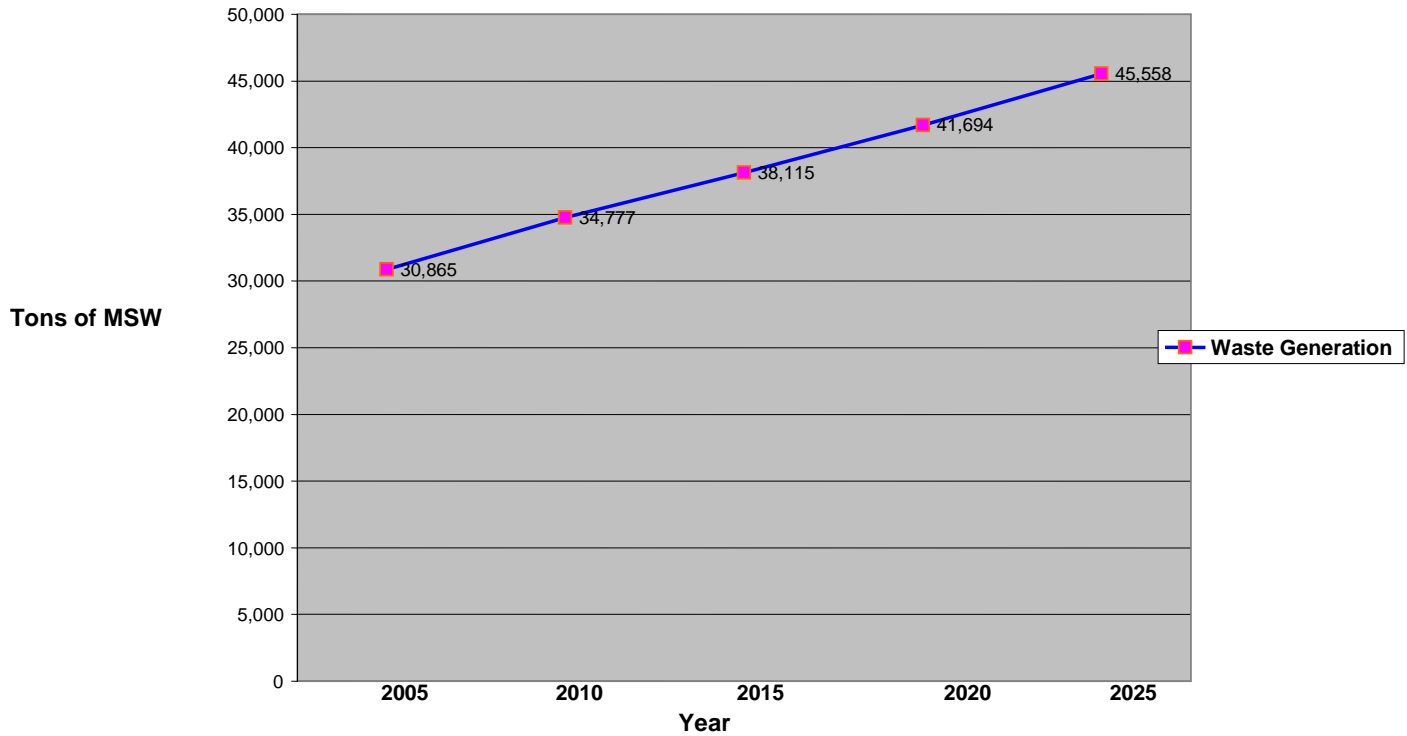
<sup>10</sup> Based upon an estimated recycling rate of 12%.

<sup>11</sup> Based upon an estimated recycling rate of 12%.

<sup>12</sup> Town of Plainfield Annual Report, 2005.



**Figure 1: Projections of Municipal Solid Waste Generation for Sullivan County**



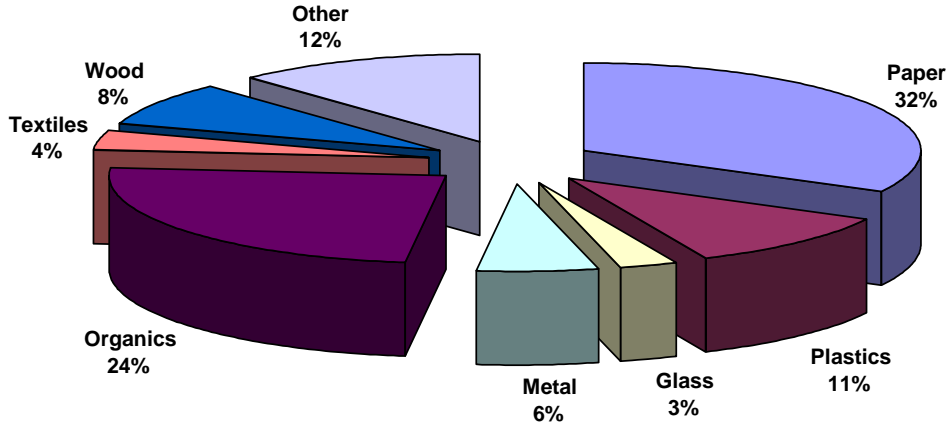
**Waste Composition**

An analysis of waste composition is a fundamental first step in understanding how to develop appropriate systems for diverting waste from disposal through recycling, composting, and other waste diversion methods. To the best of our knowledge, no institution or organization has conducted a waste composition analysis specifically for Sullivan County. However, waste composition studies from other comparable populations can provide valuable starting points. According to a study conducted by the Pennsylvania Department of Environmental Protection,<sup>13</sup> paper and organic materials such as food and yard waste compose over 50% of the waste stream. Overall, we estimate that close to two-thirds of municipal solid waste could potentially be recycled or composted, while the U.S. Environmental Protection Agency puts this figure closer to 75%. (See Figure 2: *Composition of Municipal Solid Waste* and Figure 3: *Potential Recyclability of Materials* below for more detail.<sup>14</sup>)

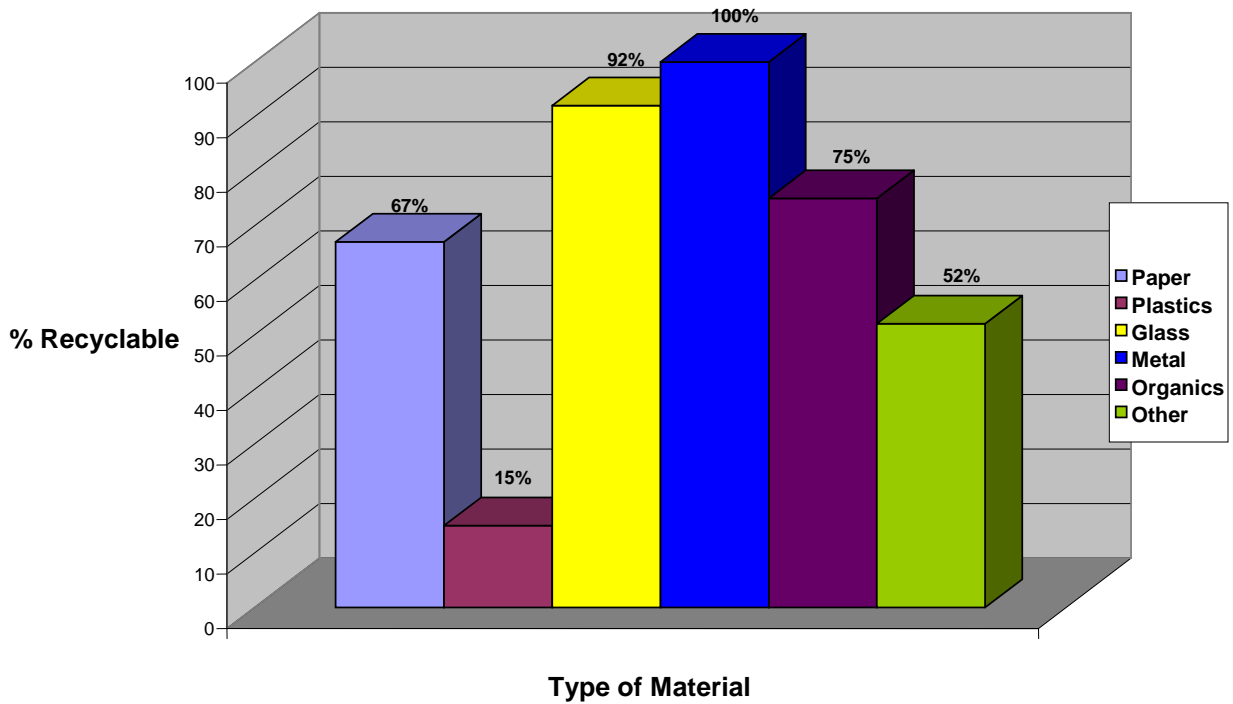
<sup>13</sup> Composition of Municipal Solid Waste, April 2003. Pennsylvania Department of Environmental Protection, Harrisburg, PA.

<sup>14</sup> Other includes textiles, unpainted wood, painted wood, carpet, drywall, other construction and demolition debris, electronics, household hazardous waste, and other waste.

**Figure 2: Composition of Municipal Solid Waste  
(% by weight)**



**Figure 3: Potential Recyclability of Materials**



Of the approximately 3,700 tons of waste currently recycled in Sullivan County, it is estimated that the following percentage of materials are recycled<sup>15</sup>:

**Table 2: Estimated Percentage Materials Recycled in Sullivan County**

Type of Material	% diverted
Paper	23
Plastics	5
Glass	44
Metal	15
Organics	2
Textiles	0
Wood	0
Other	0

### Current Waste Management System

As noted above, 12 of 15 municipalities in Sullivan County are part of the New Hampshire Vermont Solid Waste Project - a bi-state group of 29 towns that are under long-term contract to supply trash to the Wheelabrator Claremont waste incinerator. These municipalities are Acworth, Claremont, Cornish, Croydon, Goshen, Grantham, Landgon, Lempster, Newport, Plainfield, Sunapee, and Springfield. The three remaining towns in Sullivan County make their own arrangements for waste disposal; Unity has its own landfill, while Washington and Charlestown send their waste to the landfill in Berlin, NH.

Sullivan County is a mixture of rural and urban communities. Residents and businesses have the option of disposing of their solid waste through drop-off facilities or through curbside collection. Sullivan County residents have the ability to self-haul their solid waste and recyclable materials to a number of local solid waste transfer stations/recycling centers. There are a total of 12 transfer stations/recycling centers in the County, with most of these transfer stations co-located with a recycling center (except for the Town of Cornish which has only a recycling drop-off center). Springfield residents are served by the Town of Sunapee transfer station. All transfer stations and recycling facilities are municipally-owned, with the exception of the Newport transfer station/recycling center which is privately-owned.

These transfer stations/recycling centers require individuals and businesses to transport their own waste materials to the facility. Waste materials are deposited in roll-off containers, while recyclable materials are usually source separated (usually by the waste generator) and deposited in various types of containers. All facilities are staffed and the hours of operation vary. Most of these facilities accept a wide range of other materials, including white goods (refrigerators, washers, etc.), waste oil, and construction and demolition debris. Several facilities accept yard waste which is composted on site. Many of the towns sponsor periodic collections of household hazardous waste through a host organization, such as the Upper

<sup>15</sup> Based upon historical records from Springfield, MA materials recovery facility.

Valley Lake Sunapee Regional Planning Commission. Several facilities also have “swap shops” where residents can drop off items to be reused by others. (See Attachment C: *Summary Table of Sullivan County’s Waste and Recycling Collection Programs.*)

There is no clear information about what percentage of waste is collected at drop-off transfer stations versus curbside waste collection. Most of the residents in smaller, rural communities take their solid waste to local transfer stations, while residents in the larger communities, such as Claremont and Newport, are served principally by private waste haulers. The Town of Plainfield has the only curbside recycling collection program in Sullivan County. This program, along with waste collection services, is contracted through the Town of Plainfield.

## Chapter 2: Where We Need to Go

### Proposed Recycling and Waste Management System for Sullivan County

#### Why Recycle?

Why shouldn't Sullivan County continue its current practices of disposing an estimated 87% of its waste in incinerators and landfills?

There are several compelling reasons for diverting waste from disposal through increased waste reduction, reuse, and recycling. Recycling:<sup>16</sup>

- **Saves money:** Households can save money by reusing materials and products and by practicing smart shopping habits that reduce waste. In some communities, households are charged for waste collection based on how much waste they produce – any waste they reduce saves them money.
- **Saves natural resources:** Reusing discarded products and using recycled materials to make new products reduces the use of virgin materials, which often involves harvesting trees and mining the earth. Even better, “source reducing” waste – or avoiding the generation of discards in the first place – saves the most resources of all.
- **Reduces environmental problems that come from landfills and incinerators:** Landfills and waste incinerators contribute to air and water pollution.
- **Saves energy and prevents pollution:** Enormous amounts of energy are required to make products and materials worldwide. Energy is saved by not using products and materials when at all possible or by reusing products in their current form. Tremendous energy savings come from using recycled instead of virgin materials in manufacturing. Almost all manufacturing processes use water and release wastewater and air emissions into the environment. Reducing and reusing products reduces manufacturing pollution, just as the use of recycled instead of virgin materials reduces pollution in industrial processes.
- **Creates jobs:** Recycling is an increasingly important part of our economy. For example, one study showed that more than 10,000 recycling jobs existed in North Carolina. A Massachusetts study estimated that more than three percent of the Massachusetts workforce worked in recycling-related fields.<sup>17</sup>

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<sup>16</sup> N.C. Division of Pollution Prevention and Environmental Assistance (DPPEA), <http://www.owr.ehnr.state.nc.us/recycleguys/why.asp>

<sup>17</sup> “Fact Sheet, “The Massachusetts Recycling Economy.” Massachusetts Department of Environmental Protection  
Antioch New England Institute, Antioch University New England, Keene, NH  
February 2007

## Toward Zero Waste: Looking at “Waste” as “Resources”

*"Zero waste is a philosophy and a design principle for the 21st Century; it is not simply about putting an end to landfilling. Aiming for zero waste is not an end-of-pipe solution. That is why it heralds fundamental change. Aiming for zero waste means designing products and packaging with reuse and recycling in mind. It means ending subsidies for wasting. It means closing the gap between landfill prices and their true costs. It means making manufacturers take responsibility for the entire lifecycle of their products and packaging. Zero waste efforts, just like recycling efforts before, will change the face of solid waste management in the future. Instead of managing wastes, we will manage resources and strive to eliminate waste."*

-- Institute for Local Self Reliance (Washington, DC)

Zero Waste is based on the concept that wasting resources is inefficient and that efficient use of our natural resources is what we should work to achieve. It requires that we maximize our existing recycling and reuse efforts, while ensuring that products are designed for the environment and have the potential to be repaired, reused, or recycled. The success of Zero Waste requires that we redefine the concept of “waste” in our society. In the past, waste was considered a natural by-product of our culture. Now, more and more people are recognizing that proper resource management, not waste management, is at the heart of reducing waste sent to landfills.

The first Zero Waste Plan was created in 1992 by the Del Norte Solid Waste Management Authority located in Crescent City, California. Since then, hundreds of communities worldwide have adopted Zero Waste as a goal and/or have developed a plan to achieve Zero Waste. The Zero Waste philosophy means a transition in thinking -- from accepting the inevitability of trash to that of viewing discarded materials as a resource that has value and should be managed as such. More specifically, Zero Waste involves<sup>18</sup>:

- ***Redesigning products and packaging for durability, reuse and recyclability:*** Instead of perpetuating our throw-away society, products would be designed that conserve resources and are easily reused or repaired.
- ***Creating jobs from discards:*** Wasting materials in landfills wastes jobs that could be created if those resources were preserved. On a per-ton basis, sorting and processing recyclables alone sustains ten times more jobs than landfilling or incineration.<sup>19</sup> Each recycling step a community takes means more jobs, more business expenditures on supplies and services, and more money circulating in the local economy through spending and tax payments.<sup>20</sup>

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<sup>18</sup> Zero Waste: A New Systems Approach - Gaining Global Ground, Marti Matsch in Ecocycle website at: <http://www.ecocycle.org/zero/index.cfm>

<sup>19</sup> Brenda A. Platt and David Morris, *The Economic Benefits of Recycling* (Washington, DC: Institute for Local Self-Reliance, February 1993), p. 9.

<sup>20</sup> Michael Lewis, *Recycling Economic Development through Scrap-Based Manufacturing* (Washington, DC: Institute for Local Self-Reliance, February, 1994).

- ***Producer responsibility:*** Zero Waste puts the responsibility for waste with the manufacturer -- not on the consumer at the back-end of the product's life. The end result is that manufacturers redesign products to reduce material consumption and facilitate reuse, recycling, and recovery.
- ***"True cost" accounting:*** The price of a product does not currently reflect the full costs of the environmental degradation and public health impacts associated with virgin resource extraction, processing, manufacture, transportation, and disposal of that product. When market prices begin to include such costs, more environmentally-friendly products will also be the less expensive.
- ***Investing in infrastructure, not landfills:*** In many communities, strategies like unit-based pricing for garbage collection (commonly known as Pay-As-You-Throw) have created tremendous incentives for residents and businesses to reduce waste and have resulted in higher landfill diversion rates. Rather than using the tax base to build new landfills or incinerators, communities have invested in recycling, composting, and reuse facilities.
- ***Ending taxpayer subsidies for wasteful and polluting industries:*** Pollution, energy consumption, and environmental destruction start at the point of virgin resource extraction and processing. Our tax dollars subsidize many industries that make products from virgin materials, such as timber and mining. Zero Waste proposes ending these federal subsidies to enable recycled and reused products to compete on an even playing field. Without the subsidies, the market can determine which are truly less expensive products.

#### What is Zero Waste?<sup>21</sup>

##### **Zero Waste:**

- Aims to eliminate rather than "manage" waste.
- Is a whole system approach that aims for a massive change in the way materials flow through society—resulting in *no waste*.
- Is both an end of pipe solution which encourages waste diversion through recycling and resource recovery, and a guiding design philosophy for eliminating waste at source and at all points down the supply chain.
- Offers new tools and new ways of thinking so that normal, everyday activities contribute to the answer rather than the problem.
- Redesigns the current, one-way industrial system into a circular system modeled on nature's successful strategies.
- Helps communities achieve a local economy that operates efficiently, sustains good jobs, and provides a measure of self-sufficiency.
- Maximizes recycling, minimizes waste, reduces consumption, and ensures that products are made to be reused, repaired or recycled back into nature or the marketplace.
- Is a powerful concept that enables us to challenge old ways of thinking and inspires new attitudes and behavior.

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<sup>21</sup> Excerpted from *The End of Waste: Zero Waste by 2020*; Zero Waste New Zealand Trust. [www.zerowaste.co.nz](http://www.zerowaste.co.nz)

## Developing the Plan

In December 2005, the Steering Committee for the Waste Action Collaborative of Sullivan County (WACSC) adopted a resolution that Sullivan County should move toward achieving 50% recycling within five years or sooner. Using the 50% recycling goal as a target, ANEI estimated how much of each waste material needed to be recovered through recycling in order to achieve the goal. ANEI estimates that by diverting an estimated 80% of each material type (e.g. newspapers, mixed paper, office paper, cardboard, #1 and #2 plastics, glass, steel and aluminum containers, yard and food waste, and wood waste) – the 50% recycling goal could be achieved.

ANEI hired a consultant to conduct an economic analysis of alternative systems to determine the most cost-effective approaches to achieving the 50% recycling goal. The recycling analysis identifies how much of each waste material could be diverted from disposal and includes a set of programs for managing various types of waste, with a high priority on recycling and waste reduction, including containers (plastic, metal, and glass), recyclable fiber (newspaper, cardboard, and mixed paper), and compostable components (yard and food waste). (See Attachment E: *Analysis of Alternative Solid Waste Management Systems for Sullivan County, NH: Steps and Timeframe.*)

The process for the economic analysis of alternatives is described in detail below.

### ***Step 1: Identified Viable Solid Waste Facilities***

The Steering Committee identified the major solid waste facilities that should be considered in the analysis of alternatives, including how waste and recyclables should be collected, diverted, processed, transferred, and disposed. The Steering Committee agreed that the following potential solid waste facilities should be considered within Sullivan County:

- Drop-off collection
- Curbside collection
- Recycling facilities
- Composting facilities
- C&D recycling facilities
- Transfer stations

The Steering Committee reached this decision by looking at a broad range of potential solid waste facilities and applying the following criteria to determine viability:

- *Regulatory requirements* – does the system violate federal, state or local regulations or ordinances?
- *Land-use requirements* – are there land-use or siting requirements that prohibit the system from the County?
- *Site requirements* – does the system require a site (size or features) that is not viable in the County?
- *Economy of scale requirements* – does the system require a quantity of waste greater than that generated in the County in order to operate economically?

As a result, three major solid waste systems were eliminated from further consideration for development or operation within Sullivan County, including construction of a new anaerobic



digester<sup>22</sup>, new waste incinerator, and new landfill in Sullivan County. These facilities were eliminated principally because they require a larger amount of waste to be economically viable that is unavailable within Sullivan County, i.e. lack of economy of scale.

**Step 2: Targeted Waste Materials for Recycling and Composting**

As a next step, the Steering Committee identified those components of the waste stream that should be targeted for waste diversion through recycling and composting programs. The Steering Committee identified the following priority materials that should be targeted for recycling and composting:<sup>23</sup>

**Table 3: Materials Targeted for Recycling and Composting**

Material	Type
<b>Paper</b>	Newspaper, cardboard, office paper, mixed paper
<b>Glass Containers</b>	Clear, brown, green, mixed
<b>Metal Containers</b>	Aluminum, steel
<b>Plastic Containers</b>	Bottles (#1 & #2), other bottles, tubs and jars
<b>Organics</b>	Yard waste, food waste
<b>Scrap Metal</b>	Ferrous, non-ferrous
<b>C&amp;D Debris</b>	Asphalt, brick, and concrete; metal
<b>Other Materials</b>	Tires, electronics, reuse/swap items

The Steering Committee reached this decision by applying the following five criteria to determine which waste materials should be targeted:

- *Quantity* – how much of the material is discarded relative to other components of the waste stream?
- *Market value* – what is the relative value of the material?
- *Access to markets or beneficial use* – are markets or beneficial use options readily available?
- *Status of current diversion efforts* – is the material currently part of recovery programs?
- *Ease of separation and diversion* – how easily is the material separated and processed for diversion?

After applying the criteria to the list of potential recyclable materials, the Steering Committee eliminated the following materials for further consideration: bulky waste, other plastic containers (beside #1 and #2 plastic), rigid plastic, plastic film, aseptic/gable top<sup>24</sup> containers, and soiled paper.

<sup>22</sup> An anaerobic digester is an industrial system that harnesses natural biological process to treat waste, produce biogas that can be used to power electricity generators, provide heat and produce soil improving material.

<sup>23</sup> Note that materials that are regulated or require special environmental management (e.g. universal waste, used oil, hazardous waste) are considered separately.

<sup>24</sup> Commonly referred to as “drink boxes.”

***Step 3: Narrowed the List of Solid Waste Facilities and Programs for Further Consideration***

Next, the Steering Committee started with the list of potentially viable facilities and programs (identified under Step 1 above) and identified a range of potential options within each of these facilities/programs. For example, with the category of “composting facilities” the Steering Committee considered backyard composting, rural drop-off for yard waste, new centralized yard waste composting facilities, new centralized source-separated food and yard waste composting facility, and new mixed waste composting facility. This list of potential programs and facilities focused on practical and state-of-the-art options for collecting and processing recyclable and compostable materials targeting high ranking materials (identified under Step 2 above), as well as management of residual materials. (See Attachment F: *Solid Waste Programs and Facilities for Consideration in the Analysis of Alternatives.*)

This step of the process also involved: 1) establishing performance parameters for programs and facilities, (e.g. desired participation and capture rates), 2) establishing evaluation criteria to be used in selecting these programs and facilities, and 3) narrowing the list of solid waste programs and facilities that are considered for the more detailed analysis. The Steering Committee used the following criteria to help evaluate potential programs and facilities:

- Cost-effectiveness
- Total capital/operating costs
- Effectiveness in achieving goals
- Environmental/public health impacts
- Local/regional impacts on infrastructure
- Public acceptability
- Flexibility
- Diversion potential
- Ease of use/simplicity

The Steering Committee then applied the criteria to the list of potential solid waste programs. As a result, the Steering Committee developed two major solid waste system scenarios to be considered for more detailed analysis, as described below:

- ***Scenario 1:*** Under Scenario 1, towns would haul recyclable materials to an existing out-of-county materials recovery facility, while solid waste would be hauled directly through packer trucks or town roll-off containers to an out-of-county waste disposal facility. Towns would continue to use their own drop-offs and recycling centers, while curbside recycling would be expanded to Claremont, Newport, and Charlestown (Plainfield would continue to have curbside collection). Curbside collection would be either single stream or dual stream.<sup>25</sup> Recyclable materials would be hauled to a new recycling transfer station where they would be consolidated and then sent to an existing out-of-county materials recovery facility (MRF). Source separated materials collected at recycling drop-off centers would continue to be marketed directly through NRRA or other markets. Yard waste would be composted at existing town sites, and citizens would be encouraged to do backyard composting of food and yard wastes through economic incentives and

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<sup>25</sup> Dual stream MRFs accept two separate streams of recyclable materials: fiber (cardboard, mixed paper, etc.) and containers (glass, metal, plastic). Single stream MRFs accept these materials combined.

education. Towns would promote job-site separation of C&D materials that could then be sold at a store for used building supplies. Other C&D materials would be sent to an existing out-of-county C&D processing facility.

- **Scenario 2:** Scenario two differs from Scenario One in several aspects. First, Scenario Two envisions the construction of a new materials recovery facility in Sullivan County that would have the capacity to process and sort recyclable materials to be sent directly to market. The MRF could accept recyclable materials from towns and haulers outside of Sullivan County, as well. The analysis examined both single and dual-stream MRFs. Some materials would continue to be marketed through NRRRA. For waste disposal, Scenario Two includes the construction of a new centralized waste transfer station that would have the capacity to collect and consolidate solid waste from town transfer stations and waste hauling trucks, consolidate the waste, and economically transport the waste to out-of-county disposal facilities. Recyclable materials collection and other programs remain unchanged between the two scenarios. For organic waste, a new centralized organics composting facility would be constructed to accept principally yard and food waste. Other programs envisioned under Scenario One for managing C&D remain unchanged.

## Proposed System

Sullivan County towns could reduce their current annual waste disposal bill by over \$1,000,000 by increasing recycling levels in their communities to 50%. As noted earlier, Sullivan County towns recycle only 13% of their waste yet pay an estimated \$2,352,000 in waste disposal costs (not including collection costs). In 2005, residents could have diverted an additional 11,650 tons from disposal if they had recycled 50% of their waste -- and saved money in the process. (See Attachment G: *Cost of Waste Disposal for Sullivan County* for more calculations.<sup>26</sup>) Shifting from a waste-oriented economy to a recycling-oriented economy will require significant changes in personal behavior, investments in appropriate infrastructure, and large-scale public awareness and education programs. The recycling and waste management system included below is based upon the waste management hierarchy of waste reduction, reuse, and recycling as the highest priorities.

## Waste Reduction and Reuse

**Proposed Actions:** Implement extensive public education and outreach programs to educate residents and businesses on how to reduce waste at the source and to expand opportunities for reuse.

### Introduction<sup>27</sup>

During the past 35 years, the amount of waste each person generates has increased from 2.7 to

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<sup>26</sup> Sullivan County towns recycled an estimated 3,785 tons in 2005. If a 50% recycling rate were achieved, an estimated 15,432 tons would have been diverted – or an additional 11,650 tons. The average disposal fee for Sullivan County waste is approximately \$87/ton (\$2,352,912/27,070 tons disposed). We compared this cost to the \$0 cost for processing recycling materials in Keene, NH. See Attachments A and B below.

<sup>27</sup> Adopted from: U.S. Environmental Protection Agency. <http://www.epa.gov/msw/sourcred.htm>

4.4 pounds per day. The most effective way to stop this trend is by preventing waste in the first place. Waste reduction, also known as "source reduction," is the practice of designing, manufacturing, purchasing, or using materials (such as products and packaging) in ways that reduce the amount or toxicity of waste generated. Reusing items is another way to stop waste at the source because it delays or avoids that item's entry in the waste collection and disposal system. Source reduction, including reuse, can help reduce waste disposal and handling costs because it avoids the costs of recycling, municipal composting, landfilling, and combustion. Source reduction also conserves resources and reduces pollution, including greenhouse gases that contribute to global warming.

In Sullivan County, several local transfer stations/recycling centers have "reuse centers" where residents can exchange items such as furniture and household goods free-of-charge. ANEI is unaware of any active, systematic efforts within Sullivan County to encourage residents and businesses to reduce and/or reuse waste.

The benefits of waste reduction and reuse include:

- ***Saves natural resources.*** Waste is not just created when consumers throw items away. Waste is generated throughout the life cycle of a product – from extraction of raw materials to transportation to processing and manufacturing facilities to manufacture and use. Reusing items or making them with less material decreases waste.
- ***Reduces toxicity of waste.*** Selecting nonhazardous or less hazardous items is another important component of source reduction. Using less hazardous alternatives for certain items (e.g., cleaning products and pesticides), reading label directions carefully, and using the smallest amount necessary are ways to reduce waste toxicity.
- ***Reduces costs.*** The benefits of preventing waste go beyond reducing reliance on other forms of waste disposal. Preventing waste also can mean economic savings for communities, businesses, schools, and individual consumers.

***Municipalities can undertake a broad range of programs to promote waste reduction***<sup>28</sup>

- ***Hold special events:*** Communities can promote special events like "Holiday Waste Reduction" that targets extra waste generated around the holidays, such as Christmas trees, gift wrapping, packaging, and food. In California, communities participate in a "Second Chance Week" which is a grassroots public awareness campaign held to promote reuse, repair, resale, and donation opportunities.
- ***Target a specific activity:*** Several communities in the U.S. have implemented programs that educate citizens about how to purchase items that come with less packaging.
- ***Target certain materials:*** Some communities have targeted specific materials such as yard waste, paper products, and packaging. For example, some communities have teamed up with retailers to promote the sale of mulching lawn mowers that reduce or eliminate the need for collecting grass clippings. College cafeterias offer discounts to

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<sup>28</sup> California Integrated Waste Management Board. [www.ciwmb.ca.gov/WPW/Coordinator/media.htm](http://www.ciwmb.ca.gov/WPW/Coordinator/media.htm)  
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students who use their own mugs, thus reducing the need for paper products. Municipalities have also been actively involved in helping residences reduce food waste by providing incentives for backyard composting.

- **Encourage use of reusable materials:** Communities can promote stores that sell reusable items. Examples include flea markets, second hand stores, and stores that sell reusable building supplies.
- **Promote waste reduction and reuse through local policies:** Local governments can lead by example by implementing waste reduction programs within local government. Local governments can encourage others to follow suit by "leveling the playing field" for businesses that want to reduce waste by developing policies that encourage waste reduction and the purchase of recycled-content products. These policies are implemented by adopting local ordinances and building codes, incorporating waste reduction requirements into local building permits, and providing low-interest loans for businesses that promote reduction and reuse.

### Waste reduction for business<sup>29</sup>

According to the U.S. Environmental Protection Agency (EPA), the U.S. commercial sector generates between 35% and 45% of the municipal solid waste stream. Businesses can not only gain a competitive advantage by reducing waste, but they can also help protect the environment. In fact, source reduction and reuse offer a number of benefits including:

- saving money through reduced purchases;
- reducing the amount of waste requiring collection and disposal;
- increasing efficiency and productivity;
- conserving energy, which can also save money; and,
- enhancing the business' image within the community and with its customers.

Companies can undertake a range of activities to divert waste from disposal through waste reduction and recycling, including:

- **Establish a source reduction policy:** Businesses can make a commitment to reduce waste by developing a clearly defined philosophy and policy to conserve resources and save money.
- **Conduct a waste assessment:** A waste assessment, or audit, can help determine the weight, volume and the types of waste materials being generated. Evaluating the company's waste stream will also help identify potential source reduction and reuse options.
- **Organize teams to promote source reduction:** Employees can work in teams to develop simple and innovative practices that can be used to reduce waste. This teamwork often leads to expanded, more comprehensive source reduction programs down the road.
- **Measure progress and share results:** Once the initiative is underway, businesses should measure their progress and share the lessons they have learned with other companies.

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<sup>29</sup> Source Reduction Forum, National Recycling Coalition. [www.nrc-ecycle.org/councils/SRF/business.htm](http://www.nrc-ecycle.org/councils/SRF/business.htm)  
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Businesses can learn from one another about what makes a successful source reduction program and gain insight into other potential source reduction activities.

- **Reach out to customers:** Companies should communicate their source reduction efforts to their customers and encourage consumer feedback. This input will help support the implementation of source reduction programs and can help overcome customer concerns about the impacts of source reduction on product quality or customer service.

States are implementing a range of other innovative approaches to help households and businesses reduce waste, including:

- **Vermont Environmental Assistance Program (VEAP)** provides cost-effective and sustainable environmental assistance to Vermont businesses, with the emphasis on long-term pollution prevention methods and processes wherever feasible. The partnership provides direct assistance to businesses, technical assistance through workshops and seminars, and assistance in permitting and compliance. VEAP is a partnership of the State Department of Economic Development and Department of Environmental Conservation, the not-for-profit Vermont Small Business Development Center (SBDC), and the Vermont Manufacturing Extension Center (VMEC).<sup>30</sup>
- **The New Hampshire Materials Exchange (NHME)** links generators of a diverse assortment of materials with potential users. The NHME operates a listing of materials available and wanted by a wide range of users, including businesses, schools, and non-profit groups. This saves disposal costs for waste generators and purchasing costs for users.<sup>31</sup>

## Recyclable Materials

**Proposed Action:** Maintain the existing network of transfer stations and recycling centers in Sullivan County. Institute curbside recycling in areas that are served by curbside waste collection, particularly Claremont, Newport, and Charlestown. Construct a new, centrally located materials recovery facility – either single or dual stream.

### Recycling Collection

Currently, all residents in Sullivan County who utilize drop-off, waste transfer stations have easy and convenient access to drop-off recycling. Not coincidentally, the best recycling rates in Sullivan County are in communities with drop-off waste transfer and recycling centers. Currently, only the Town of Plainfield has curbside recycling collection through a private hauler contracted by the town. Plainfield also has municipally-contracted waste collection.

Meanwhile, larger communities, such as Claremont and Newport, are served principally by private waste haulers who provide waste collection services but not recycling collection services. Sullivan County towns can significantly increase recycling by ensuring that all residents that are currently served by curbside waste collection also receive curbside collection

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<sup>30</sup> Vermont Environmental Assistance Partnership. [www.veap.org](http://www.veap.org)

<sup>31</sup> <http://www.wastecapnh.org/nhme/home.asp>

of recyclable materials. The U.S. Environmental Protection Agency estimates that there were almost 9,000 curbside programs in the United States in 2005.<sup>32</sup>

There are three basic types of collection options for recyclable materials: curbside sort, dual-stream, and single-stream collection. Curbside sorting involves the separation of recyclable materials at the curbside by the operator of the collection vehicle.<sup>33</sup> For dual-stream recycling, recyclable materials are sorted into two basic categories: fiber (cardboard, mixed paper, etc.) and containers (glass, metal, plastic). These materials are then taken to a materials recovery facility where they are further sorted and processed. Under single-stream collection, fibers and containers are collected in one recycling container, placed into a non-compartmentalized truck, and then sorted at a MRF.

In general, curbside sorting of materials has proven to be the most expensive, while single-stream collection is less expensive than dual-stream collection due to collection efficiencies. Further, single-stream collection allows waste haulers to utilize existing waste hauling trucks to collect recyclable materials, while dual-stream usually require separate collection of containers and fibers or the use of specialized trucks. (See Table 4: *Curbside Collection Costs by Type of Collection* below.) In general, single-stream collection can result in increased participation levels by residents and businesses since all materials can be placed into a single-bin. On the other hand, single-stream collection generally results in higher contamination levels of recyclable materials due principally to higher levels of glass breakage and is less preferred by recycling markets. Industry trends appear to be moving in the direction of single-stream collection and away from dual-stream recycling and curbside sorting – particularly in larger, more urban areas.

**Table 4: Curbside Collection Costs by Type of Collection**

	<u>\$/Ton</u>	
	Low	High
<b>Recyclables</b>		
Curbside sorting	\$110	\$120
Two (dual) stream	\$85	\$95
One (single) stream	\$65	\$75
<b>Municipal Solid Waste</b>		
Manual	\$55	\$65
Automated	\$40	\$50

### Recycling Processing Options

ANEI looked at two primary options for processing recyclable materials generated in Sullivan County. The first option involves construction of a recycling transfer station (TS) wherein recyclable materials would be consolidated and transferred to an out-of-county materials recovery facility (MRF). For single-stream collection, the analysis examined the costs associated with hauling recyclable materials to Chittenden County, Vermont -- the only single-stream MRF in the region. For dual-stream collection, the analysis was based upon hauling recyclable materials to the MRF in Keene, NH.

<sup>32</sup> U.S. Environmental Protection Agency, Washington, DC. [www.epa.gov/epaoswer/non-hw/muncpl/recycle.htm](http://www.epa.gov/epaoswer/non-hw/muncpl/recycle.htm)

<sup>33</sup> Curbside sorting was not included in this analysis due to the high associated collection costs.

Option two involves the construction of a new materials recovery facility in Sullivan County wherein recyclable materials would be sorted, processed, and sent to recyclable markets. The analysis looked at the construction of a single-stream MRF wherein fibers and containers would be collected commingled, and a two-stream MRF wherein fibers and containers would be collected separately.

The analysis indicates that the most cost-effective option for processing recyclable materials is the construction of a new dual-stream MRF in Sullivan County.<sup>34</sup> (See Figure 4: *Analysis of Recycling Processing Options for Sullivan County*.) As Figure 4 indicates, a dual-stream MRF in Sullivan County would result in net revenue of \$7/ton, a single-stream MRF in Sullivan County would cost approximately \$11/ton, and constructing a new recycling transfer station and sending recyclable materials to the MRF in Keene, NH would cost an estimated \$13/ton.

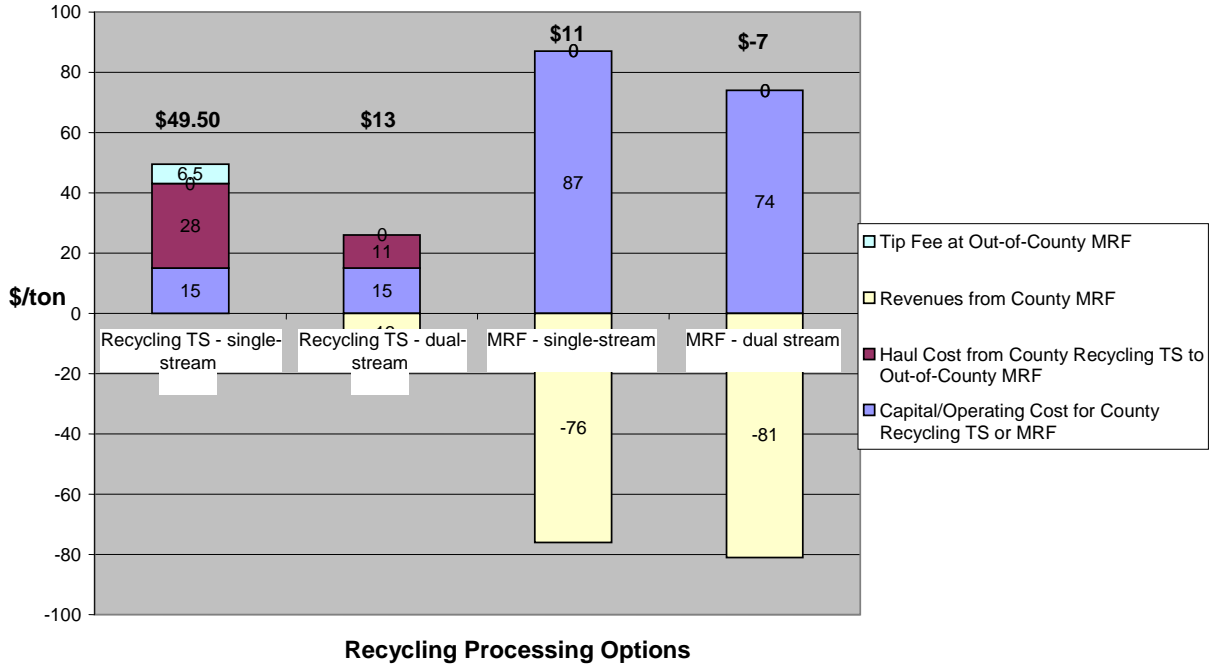
This conclusion is due to several factors. First, the cost of transporting unprocessed recyclable materials over long distances can be expensive. Second, the revenue associated with selling processed recyclable materials directly to a market is quite substantial at current market prices - offsetting capital and operating costs.

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<sup>34</sup> Assumptions include: *Recycling Transfer Station* -- Assumes the construction of a new centralized recycling transfer station to consolidate recyclable materials without processing or sorting. Materials would be sent to an out-of-county materials recovery facility. *Materials Recovery Facility (MRF)* -- assumes the construction of a new centralized MRF where recyclable materials would be sorted, processed, and sent to markets. *Hauling costs* to haul recyclables from the recycling transfer station are estimated to be \$2.00-\$2.20 per mile for roll-off trucks. Per ton cost varies depending on distance to MRF. *Revenue* generated from sale of recycled materials at the new MRF based on current market values from Northeast Resource Recovery Association. Revenues from dual-stream MRF are assumed to be higher due to lower contamination levels. *Tip fees* for recyclable materials at the Chittenden MRF (1-stream) and revenues for the Keene MRF (2-stream) are based on a survey conducted by Antioch New England Institute in February 2006. (See Attachment M: *Survey of Selected Materials Recovery Facilities in Vermont and New Hampshire*.)



**Figure 4: Analysis of Recycling Processing Options for Sullivan County**



Revenues for recyclable materials that are baled and delivered to market are relatively high. For example, the average price of curbside recyclable materials increased from \$33/ton in 1991 to over \$90/ton in 2006. As another indicator, the bottom-end prices for recyclable materials increased an estimated 43% in real terms from 1991-93 to 2001-02.<sup>35</sup> Current revenues for recyclable materials are estimated as follows:<sup>36</sup>

**Table 5: Current Market Rates for Selected Recyclable Materials**

Recyclable Material	\$/ton
Aluminum cans	\$1,300 - \$1,400
#2 Plastic (HDPE)	\$480 - \$500
#1 Plastic (PET)	\$280 - \$300
Corrugated cardboard	\$70 - \$80
Mixed paper	\$35 - \$45
Steel cans	\$65 - \$75
Scrap metal	\$60 - \$65
Glass containers	\$10

<sup>35</sup> "Prices for Recycled Commodities," 2006. Sound Resource Management Group. [www.zerowaste.com/RecyclingMarkets.htm](http://www.zerowaste.com/RecyclingMarkets.htm)

<sup>36</sup> Northeast Resource Recovery Association, Epsom, NH, September 2006. Assumes baled and freight-on-board (FOB) or that seller pays for transportation of the goods to the market.

In terms of single-stream versus dual-stream MRF, the analysis indicates that a dual-stream MRF would be less expensive due to lower capital and operating costs. (See Table 6: *Capital and Operating Costs for Single versus Dual-Stream MRFs* below). The economic analysis reveals that a dual-stream MRF designed to handle approximately 82 tons/day would have an estimated capital cost of \$3.3 - \$4.1 million dollars plus annual operating costs of approximately \$425,000- \$530,000. Meanwhile, the single-stream MRF of the same size would cost approximately \$3.7 - \$4.5 million, with annual operating costs of \$530,000 - \$640,000. <sup>37</sup> (See Attachment H: *Detailed Cost Analysis of Materials Recovery Facilities for Sullivan County.*)

<b>Table 6: Capital and Operating Costs for Single versus Dual-Stream MRFs</b>		
<b>Type of MRF</b>	<b>\$/ton</b>	
	<b>Low</b>	<b>High</b>
<b>Single-Stream MRF</b>		
Facility construction cost (ton/day capacity)	\$45,000	\$55,000
Facility operating cost (per ton)	\$50	\$60
<b>Dual-Stream MRF</b>	<b>Low</b>	<b>High</b>
Facility construction cost (ton/day capacity)	\$40,000	\$50,000
Facility operating cost (per ton)	\$40	\$50

The decision about whether to institute a single-stream versus dual-stream collection and processing system in Sullivan County must take into account several factors:

- **Cost-effectiveness:** Single-stream collection programs are generally less expensive to operate, while single-stream MRFs are more expensive to build and operate.
- **Public acceptability:** Generally, single stream collection is considered to be more convenient by the public and has higher participation levels.
- **Waste hauler acceptability:** What type of system will fit in well with private waste haulers who may have primary responsibility for collecting recyclable materials?
- **Contamination levels and markets:** What contamination levels are recycling markets willing to accept? In general, single-stream MRFs generate higher contamination levels.

It is important to note that a state legislative committee has recently issued a report calling for the construction of a new MRF facility in Sullivan County.<sup>38</sup>

## Organic Materials

**Proposed Actions:** Provide incentives and technical support for backyard composting. Construct a new aerated windrow composting facility to compost yard and food waste. Initiate pilot curbside food waste collection programs for restaurants, institutions, and schools in Claremont and Newport. Provide seasonal curbside collection of yard wastes.

<sup>37</sup> Based upon an estimated 10,600 tons/year.

<sup>38</sup> Report of the Commission To Study The Feasibility Of Developing A Materials Recovery Facility In Sullivan County (HB 293, Chapter 265:1, Laws of 2005)

Organic wastes such as yard, food, and other wastes comprise an estimated 24% of Sullivan County's waste stream – with food waste being the single largest organic component. These wastes can be composted<sup>39</sup> and converted into a valuable soil conditioner. As noted earlier, several drop-off recycling centers have areas for collecting organic materials such as brush and yard waste. Some Sullivan County residents compost their organic materials in their backyards, although there are no estimates on the percentage of households that actually do backyard composting.

### **Backyard Composting<sup>40</sup>**

Backyard composting is an easy and economical way for individuals to convert their organic waste into a soil amendment that they can use to mulch landscaping, enhance plant growth, enrich topsoil, and provide other benefits to plants and soil. It has the advantage of being readily adaptable to fit individual lifestyles, income, yard size, and overall ambition. Composting units or bins can be commercial units or simply constructed from inexpensive materials with little carpentry or masonry skills. Municipalities nationwide are engaging in a wide range of programs to promote backyard composting.

Backyard composting is often considered a form of source reduction because waste actually never enters the formal waste stream. Community public works managers nationwide have found that the relatively small investment needed to help citizens begin composting at home is repaid many times over as local governments no longer have to collect, transport, compost, or dispose of tons of organic material. Organic materials, such as grass clippings, leaves, yard trimmings, food scraps, and non-recyclable paper products, can be composted at home in compost bins or piles.

One nationwide study concluded that backyard composting programs are successful and cost-effective throughout the United States, regardless of community size or socioeconomic status.<sup>41</sup> When setting up a backyard composting program, governments spent an average of \$12 per ton of organic materials composted at home to educate the public and promote the program. They also received an average of \$1 per ton of solid waste in volunteer labor. Savings averaged \$23 per ton in reduced collection costs and \$32 per ton in reduced disposal costs for a total net benefit of \$44 per ton. Each household composted an average of 646 pounds per year.<sup>42</sup>

Communities saved money because they didn't have to collect or process yard waste. Residents were also able to save waste or yard waste collection fees in areas where local governments based collection fees on volume or weight of materials disposed.

Regardless of the size of the community, backyard composting programs tend to have at least a) one paid staff person who is responsible for the program, b) a subsidized home composting

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<sup>39</sup> Composting is the controlled decomposition of organic materials into a soil-like substance.

<sup>40</sup> Adopted from: Community Backyard Composting Programs, 1997. North Carolina State Extension Service, Raleigh, NC. <http://www.bae.ncsu.edu/topic/vermicomposting/pubs/composting.pdf>

<sup>41</sup> "Cost-Benefit Analysis of Home Composting Programs in the United States." 1996. The Composting Council. National Backyard Composting Program, 1996.

<sup>42</sup> IBID.

bin distribution program, and c) an outreach program that educates school children, teachers, and residences about home or in-school composting. Some programs also have an extension-run volunteer training program, a compost demonstration site, written materials, advertising, and a telephone hotline.

In 1994, the University of Wisconsin conducted a survey of 249 backyard composting programs in 40 states and two Canadian provinces. The most effective backyard composting program components were (in order of effectiveness): subsidized bin distribution, variable collection fees for refuse, volunteer training and outreach programs, school programs, workshops, books or booklets distribution, utility bill inserts, demonstration sites and displays, bin distribution at cost, and newspaper ads.

A proven method of getting residents started in home composting is to provide the equipment they need. Equipment may include compost bins, kits for converting mowers for grass-cycling, compost aeration tools, and other composting tools. This equipment may be given away, sold at workshops or other events, delivered directly to residents, or distributed through retailers. Local governments can save money by staging co-promotions with bin manufacturers or retailers and by coordinating bin ordering and delivery. Retailers can help with advertising and can provide discount vouchers or rebates on bins and tools. Communities can recoup bin distribution expenses through avoided yard waste collection and disposal or processing costs. Compost bins distributed by communities do not have to be commercially-made; instead, they can be made locally or converted from used materials like wooden pallets, trash cans, or industrial drums. According to the University of Wisconsin survey of 25 communities that subsidized the cost of bin distribution programs, the average subsidy was \$18.50 per bin.<sup>43</sup>

### **Centralized Composting Facility**

Currently, there are no centralized composting facilities in Sullivan County with the ability to compost organic materials such as yard and food waste. There are numerous technologies for composting large quantities of organic materials, including aerated windrow, static pile, and in-vessel composting. ANEI focused its analysis on the construction of a new, aerated windrow facility for composting yard and food wastes because of its cost-effectiveness and relatively low capital requirements.

Windrow composting involves the formation of long piles called "windrows" that are aerated by turning the pile periodically through either manual or mechanical means.<sup>44</sup> The piles are usually between four – eight feet high and 15 feet wide -- which allows for a pile large enough to generate sufficient heat and maintain temperatures, yet small enough to allow oxygen to flow to the windrow's core. Windrow composting facilities can accommodate large volumes of diverse wastes, including yard trimmings, food, and some commercial organic waste. This method is suited for large quantities, such as that generated by entire communities and collected by local governments, as well as high volume food-processing businesses (e.g., restaurants, cafeterias, packing plants). Windrow composting can work in cold climates, and while the outside of the pile might freeze, the core temperatures can still reach 140 °F.

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<sup>43</sup> "Community Backyard Composting Programs," 1996. University of Wisconsin. [www.bae.ncsu.edu/topic/vermicomposting/pubs/composting.pdf](http://www.bae.ncsu.edu/topic/vermicomposting/pubs/composting.pdf)

<sup>44</sup> <http://www.epa.gov/epaoswer/non-hw/composting/windrow.htm>

Windrow composting requires large tracts of land, sturdy equipment, a continual supply of labor to maintain and operate the facility, and patience to experiment with various materials mixtures and turning frequencies. Leachate, or liquid released during the composting process, can potentially contaminate local ground-water and surface-water supplies and should be managed properly.

We estimate that a simple windrow facility could be built for a capital cost of approximately \$150,000. With annualized capital costs of approximately \$20,000 and annual operating costs of \$92,000, the facility could operate process 3,500 tons/year for an estimated cost of \$26/ton. (See Attachment I: *Preliminary Cost Estimates for an Aerated Windrow Composting Facility in Sullivan County.*)

To collect organic materials, municipalities throughout the U.S. and Europe have incorporated organics collection into their curbside programs, such as through a “green bin” program where food and yard waste are collected on a regular basis and then composted. Another option is seasonal collection of materials such as leaves and other yard waste. Several municipalities have tackled food waste from commercial generators, such as restaurants and grocery stores, as a first step in addressing this significant component of the waste stream. (See *Case Study: Food Waste Collection for Businesses and Schools* below.)

## Case Study: Food Waste Collection for Businesses and Schools<sup>45</sup>

### Central Vermont Solid Waste Management District

The Central Vermont Solid Waste Management District (CVSWMD) has launched a Business and School Organics Program to work with area restaurants, commercial food waste generators, and schools to keep food waste out of the landfill. The material is diverted to a composting facility where it can be recycled into a valuable soil amendment, rather than wasted. As of October 2006, 750 tons of food waste from businesses had been diverted through composting, while schools had diverted another 64 tons (as of October 2006). The CVSWMD offers free employee training, free instructional signs for the work spaces, free hauling of food waste for the first three months, 100% subsidized tipping fees for the first three (3) months, free sturdy 48-gallon totes for food waste, and help in renegotiating the waste contract with waste haulers to reflect the savings from food waste diversion. After the initial three month period, restaurants and grocery stores are charged \$30/ton tipping fee - far below the tipping fee for waste disposal of \$95 – plus a fee of \$1.50 per tote pick-up and \$5/pick-up.

### Construction and Demolition Debris

**Proposed Actions: Promote onsite, source separation programs for new construction and renovations. Promote deconstruction programs for building demolition. Support the establishment of a new business or non-profit organization to sell reused building materials.**

Construction and demolition (C&D) debris consists of the materials generated during the construction, renovation, and demolition of buildings, roads, and bridges. C&D debris often contains bulky, heavy materials that include: concrete, wood (from buildings), asphalt (from roads and roofing shingles), gypsum (the main component of drywall), metals, bricks, glass, plastics, salvaged building components (doors, windows, and plumbing fixtures), and trees, stumps, earth, and rock from clearing sites.

While there are no specific estimates for the amount of C&D waste generated in Sullivan County, the State of Vermont estimates that C&D waste comprises almost twenty percent of Vermont's trash. Accordingly, ANEI estimates that approximately 6,000 tons of C&D waste was generated in Sullivan County in 2005.<sup>46</sup> Some C&D materials are sent to the ERRCO C&D recycling facility in Epping, NH (tipping fees of up to \$54/ton for commingled C&D materials). The ERRCO facility accepts commingled demolition materials (asphalt shingles, wood, sheetrock, concrete, brick, aggregates and wire), clean separated waste wood (100% painted, unpainted, stained, glued and plywood), wood pallets, and pre-sorted containers/roll-offs of sheetrock, metal, ceiling tiles, insulation, wood, aggregates, plastic, cardboard, shingles, and paper. End products for the materials include woodchips sold for fuel to biomass plants, alternative daily cover for landfills, and clean fill.

In New Hampshire, there is presently a moratorium on incineration of C&D material.

<sup>45</sup> "Business and School Organics Program," 2006. Central Vermont Solid Waste Management District. [www.cvswmd.org](http://www.cvswmd.org)

<sup>46</sup> C&D waste is not typically considered to be part of municipal solid waste for definition purposes. We have included C&D in this plan because it comprises such a significant portion of the waste stream. We estimate approximately 6,000 tons of C&D were generated in Sullivan County in 2005 (20% of 31,000 tons).

### Source Separation of C&D

Source separation is an important management technique for reducing C&D waste wherein materials are separated and placed into separate containers for recycling or reuse rather than placing discarded materials all into one large container. Reuse and recycling of C&D materials is one component of a larger building practice called “green building construction.” The efficient use of resources is a fundamental tenet of green building construction. This means reducing, reusing, and recycling most if not all materials that remain after a construction or renovation project.

Green building construction practices can include salvaging dimensional lumber from the project, using aggregates reclaimed from crushed concrete, or grinding drywall scraps for use on site as a soil amendment.<sup>47</sup> The Minnesota Pollution Control Agency estimates that up to 80% of demolition debris and 75% of construction waste (both by volume) could be diverted from disposal through salvage, recycling and/or recovery.<sup>48</sup>

Municipalities nationwide have adopted ordinances requiring builders to develop and implement plans for diverting a certain percentage of C&D waste from disposal through recycling and reuse. Crucial to the success of these ordinances is gaining an understanding of the composition of C&D waste, working closely with stakeholders such as builders and haulers, understanding local markets and processing facilities, and conducting adequate public outreach and education. (See Attachment J: *Sample Municipal Solid Waste Ordinances*.<sup>49</sup>)

Local governments can undertake a range of additional activities to encourage source reduction, including:

- Pass an ordinance prohibiting the sale of mercury-containing thermostats, barometers, and electrical switches for furnaces, sump pumps, and other building materials. This will protect workers from potential exposure during installation and eliminate the need to remove and reclaim mercury in the future.
- Adopt and publicize a policy promoting waste reduction and pollution prevention in all publicly funded construction, renovation, and demolition projects. This will help individual agencies and institutions to change their practices, and ultimately influence private development as well.
- Develop incentives for building contractors to reduce waste. The City of San Jose, California, requires contractors to pay a construction waste fee as part of the building permit process. The fee is returned to contractors that can demonstrate on-site reuse of materials or provide receipts for materials from recycling facilities.
- Maintain databases of local construction material recyclers and contractors who practice C&D waste prevention, and post this information on municipal web sites.

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<sup>47</sup> CA Integrated Waste Management Board, Sacramento, CA. <http://www.ciwmb.ca.gov/ConDemo/>

<sup>48</sup> Minnesota Pollution Control Agency. [www.moea.state.mn.us/greenbuilding/waste.cfm](http://www.moea.state.mn.us/greenbuilding/waste.cfm)

<sup>49</sup> “Local Government Construction and Demolition Diversion Guide,” 2006. CA Integrated Waste Management Board, Sacramento, CA. [www.ciwmb.ca.gov/LGLibrary/CandDModel/Default.htm](http://www.ciwmb.ca.gov/LGLibrary/CandDModel/Default.htm)

Contractors can use a number of tools to encourage recycling of C&D waste. For example, some contractors include clauses in their subcontractor agreements specifying that subcontractors will make good faith efforts to reduce the amount of waste generated on the job site and will recycle materials as specified by the contractor. Contractors can also work with waste haulers to reduce disposal costs. For example, some haulers will charge a lower fee for source-separated recyclable materials versus commingled C&D materials. While labor costs for separating recycled materials may be high at the onset of a project, this will decrease over time as work crews become familiar with waste reduction practices.

Builders can also encourage the proper management and reduction of hazardous components of C&D waste by:

- **Buying less toxic building materials.** When undertaking a new construction or renovation project, specify environmentally preferable building materials instead of ones that contain hazardous substances. Avoid mercury thermostats, pressure-treated lumber, and any products made of polyvinyl chloride (PVC, commonly known as vinyl).
- **Recovering toxic materials.** Segregate (a) fluorescent lamps and ballasts, (b) thermostats and electrical equipment containing mercury switches, (c) wood with lead paint or wood preservatives, (d) vinyl flooring and wall coverings, and (e) other items that contain or may create PBT (persistent and bio-accumulative toxics). It is essential to recycle these toxic materials or dispose of them as hazardous waste.

### **Case Studies: Home Deconstruction<sup>50</sup> Charlotte, Vermont**

The Birdseye Building Company reduced disposal costs for a homeowner in Charlotte, Vermont by \$3,400 in deconstructing an old home rather than demolish it. Deconstruction the building took about three weeks longer than straight demolition. Most of the salvageable materials were donated to a local used building store resale. The homeowner received a tax deduction for the materials donated and avoided the disposal costs for all 40 tons reused. Clear signs marked each recycling bin, and two closed storage bins were used to protect reusable materials during deconstruction.

### **Commercial Building Renovation Townshend, Vermont**

A manufacturer of stuffed toys, the Mary Meyer Corporation, needed to expand its corporate office in Townshend, Vermont. Under the State of Vermont's land-use planning law, the company developed a recycling plan for the project. Under the plan, the company emphasized the reuse of the discarded materials on the job site. Contractors reused the excavated materials and the concrete foundation as fill for the new wing. Some of the salvaged materials from the remodeling job were reused in the new building design. Three wire fence pens were built on the construction site for storing reusable materials and company employees were encouraged to take items home for free. The company estimated that they saved \$3,125 in rental, hauling and disposal fees, and approximately 38 % of the discarded materials was reused and recycled.

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<sup>50</sup> Vermont Department of Environmental Conservation, Division of Waste Management, Waterbury, VT. [www.anr.state.vt.us/dec/wastediv/recycling/CandD.htm](http://www.anr.state.vt.us/dec/wastediv/recycling/CandD.htm).



## **Building Deconstruction**

One popular C&D recycling technique is “deconstruction” which involves dismantling building components for reuse or recycling. In contrast to demolition, where buildings are knocked down and materials are either landfilled or recycled, deconstruction involves carefully taking apart portions of buildings or removing their contents with the primary goal of reuse.

Deconstruction can be as simple as stripping out cabinetry, fixtures, and windows, or as involved as manually taking apart the building frame.

These materials are then sold at a building materials reuse center. Usually operated by private companies or non-profit organizations, these centers accept recycled materials from deconstruction projects and resell them to the general public and builders at a reduced cost. Typical inventory at these centers includes quality used doors, windows, lumber, plywood, cabinets, vanities, flooring, trim, sinks, tubs, toilets, lighting fixtures, and more. To the best of our knowledge, there are no building reuse centers operating in Sullivan County. The closest facilities are in Brattleboro and White River Junction, Vermont.

### **Case Study: Building Materials Resource Center Boston, MA**

The Building Materials Resource Center is a non-profit building materials re-use project. The mission of the Center is twofold: (1) to equip lower income homeowners with building materials and support in order to repair and care for their homes affordably, allowing them to achieve a higher level of economic independence, build their wealth, and improve their lives and neighborhoods; and (2) to reduce the construction industry's burden on the solid waste stream by diverting perfectly good materials from landfills and delivering them into the hands of homeowners and nonprofits. The Center accepts donations of good quality used and surplus building materials and sells them to the public at low prices.

## **Household Hazardous Waste and Universal Wastes**

**Proposed Actions:** Promote widespread public education programs to encourage alternatives and proper disposal. Establish a new permanent HHW facility and roving vehicle to serve the outlying/rural areas. Encourage municipal collection of universal wastes at each municipal collection facility.

### **Introduction<sup>51</sup>**

Household hazardous waste (HHW) collection programs have come to play a vital role in the integrated solid waste management systems of communities throughout the country. HHW includes household products that contain corrosive, toxic, flammable, or reactive ingredients such as cleaners, pool chemicals, herbicides, pesticides, automotive supplies, paints, stains, glue, batteries, fluorescent bulbs, and mercury thermometers. These materials make up a small portion of the waste stream by volume (less than 1%); however, they contain potentially

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<sup>51</sup> Adopted from “Evolution of Municipal Household Hazardous Waste Collection Programs,” 2005. Mary Chamberlain, Environmental Analyst, R. W. Beck, Inc., Minneapolis, Minnesota. *APWA Congress*. <http://www.apwa.net/Publications/Reporter/ReporterOnline>

hazardous ingredients that warrant their diversion from landfills, transfer stations, incinerators, and water supplies

Some household hazardous wastes have been classified as “universal wastes” to facilitate handling and collection by municipalities and waste handlers. The N.H. Department of Environmental Services (DES) has declared the following wastes to be universal wastes: antifreeze (automotive), fluorescent lamps, mercury-containing devices (such as thermometers and thermostats), lead-acid batteries, cathode ray tubes (CRTs), and pesticides.<sup>52</sup> The NH DES allows local collections facilities to collect and store universal wastes as long as the operator has completed the state 24 hour hazardous materials training and maintains the “hazardous” designation on the state solid waste operator permit.

Also, the NHDES offers a grant program for the collection of used oil. Each community qualifies for a \$2500 annual grant for the collection, storage, treatment, handling, and use of used oil. If the communities don’t want this grant, a central facility becomes eligible to collect the combined grants from all the municipalities which use it.

In Sullivan County, several communities have organized one-day HHW collection events under a contract with the Upper Valley-Lake Sunapee Regional Planning Commission. The Commission hires a certified hazardous waste hauler to manage the event and haul hazardous materials away for appropriate recycling and disposal. Wastes collected at these events include pesticides, household chemicals, paint, fluorescent bulbs/lamps and other mercury containing items, NiCad batteries, among other items. Sullivan County towns have several options for managing universal wastes and other special wastes such as: waste oil, oil filters, tires, antifreeze, lead-acid batteries, televisions, computers, white goods/appliances, cell phones, fluorescent lamps/bulbs, other mercury containing items, Ni-Cad batteries, propane tanks, and Freon. (See Attachment K: *Existing Management Practices and Costs in Sullivan County for Selected Special Wastes* <sup>53</sup> for more details).

Over the last two decades, many municipal HHW programs have matured from annual or semi-annual drop-off collection events to more frequent, ongoing and comprehensive programs, often anchored by permanent collection facilities. Nationwide, the number of HHW collection events is in the several thousand per year, while the number of permanent collection facilities is over 500. The type of HHW collection program offered by a municipality can vary significantly depending on the priorities and the budget of the public entity.

### **Public Education Programs on Alternatives to Toxic Products**

A foundation of any HHW collection program is an on-going effort to inform the public about the types of HHW materials contained in municipal solid waste and how to properly dispose of them. These programs are often conducted as part of the regular waste reduction and recycling promotion program. At a minimum, the program should include a brochure that can be distributed at facilities or through the waste collection companies themselves. It should also include an education element to instruct people about products that are nonhazardous and which can be used instead of the common products that contain toxic materials. For example,

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<sup>52</sup> NH Department of Environmental Services, Concord, NH. [www.des.state.nh.us/hwcs/](http://www.des.state.nh.us/hwcs/)

<sup>53</sup> Based upon survey of transfer station operators of selected Sullivan County towns, November 2006.

there are numerous alternative household cleaning products that do not contain toxic ingredients. This type of education can be effective in not only educating consumers but also making them aware of the potential harm toxic products can cause if not properly handled. The education program would also include an advertising element that would inform citizens of collection events or other instructions on how to properly dispose of HHW materials. It should also include a component for informing businesses that generate small quantities of hazardous waste on the proper handling of these waste materials, also known as conditionally-exempt small quantity generators (CESQG).

### **Case Study: Environmental Depot<sup>54</sup>**

#### **Chittenden County, Vermont**

The Environmental Depot offers year-round collection of a wide variety of household hazardous wastes. The Depot is open to all residents who live in towns that are part of the Chittenden Solid Waste District, as well as businesses who qualify as conditionally exempt generators. The facility is centrally-located in the county to best serve the largest population base. The "Rover" is a mobile household hazardous waste collection unit that visits CSWD drop-off centers and other locations in the district. The purpose of the Rover is to make it convenient for residents in the more rural areas to manage their HHW properly by bringing the service to their town at least once a year. Additionally, some of the drop-off centers accept motor oil, mercury containing products, fluorescent lamps, propane cylinders, oil filters, and batteries. The Depot also recycles usable hazardous products and latex paint. All hazardous materials are bulked and shipped to permitted facilities. Currently, the CSWD accepts all hazardous waste except asbestos, explosives, medical waste or radioactive waste. The annual budget for the depot in 2005 was \$560,000, while they collected 589,000 pounds of hazardous waste. Latex paint comprised 200,000 pounds of this amount – the vast majority of which was recycled into premium paint and resold or sent to a paint manufacturer.

### **Household Hazardous Waste Collection Options**

There are numerous options for collecting HHW, as described below.

#### ➤ **Permanent HHW Collection Facility**

After years of HHW drop-off collection events, more and more municipalities are investing in a permanent HHW collection and processing facility. A permanent facility provides several benefits to a municipality including:

- ***Convenience to the residents.*** A permanent site provides residents with a year-round (or seasonal) option to properly dispose of HHW materials, rather than having to store the materials until the next collection event.
- ***Product exchange or reuse center.*** Many facilities are designed to include a product exchange area in which usable products are made available for residents to take free of charge. Likely items in a reuse program include paint, household cleaners, and automotive products. By offering these materials for reuse, a municipality can realize savings from avoided disposal costs.

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<sup>54</sup> Chittenden Solid Waste District, Chittenden County, Vermont. [www.cswd.net](http://www.cswd.net). Correspondence with Jen Holiday, Environmental and Safety Compliance Manager, CSWD, November 2006, Williston, Vermont.

- **Potential to reduce disposal costs.** A permanent facility provides the municipality with the ability to bulk materials such as flammable liquids and oil-based paint. Bulking liquid waste provides cost savings by transporting drums of waste rather than smaller containers.
- **Potential to reduce transportation costs.** A permanent facility allows the municipality to transport full loads, rather than transporting materials on a per-event basis.
- **Allows for participation by Conditionally Exempt Small Quantity Generators for a fee.** This will reduce the costs that small businesses face when disposing of hazardous materials and help reduce the overall costs of operations for residential hazardous material collections.

The size of the facility is determined by a number of factors including the quantities of materials expected, the needs of the municipality, and local zoning requirements. As experienced by the City of Fargo, most HHW programs realize economies of scale over time due to increased quantities of HHW collected and improved program efficiencies.

- **Satellite System.** Satellite HHW collection facilities are designed to support a permanent processing site. Satellite facilities serve as regular drop-off locations for program participants that typically would not travel the distance to deliver HHW materials to the central or main facility. HHW materials are regularly collected from the satellites and transported to the "hub" permanent facility where materials are sorted, bulked and lab packed for recycling or disposal. Depending on the needs and the budget of the municipality, a satellite facility could be limited to a seasonal, open-air collection site with a hazardous materials storage locker, or it could include a fully enclosed building designed to be open year-round.
- **Mobile Collection System.** With a permanent HHW collection facility, one option is to also provide a mobile collection vehicle (or rover) for communities located beyond a defined distance or radius from the permanent collection facility and satellite facilities. A collection vehicle such as a box truck and/or a trailer would be needed to conduct the mobile events. All HHW materials collected at the mobile events would be transported to the central HHW building for processing. The truck could be utilized for other duties, helping to reduce the cost of this option.
- **Curbside Collection of HHW**  
Another option for collecting HHW materials is to offer curbside collection to residents. This option could be implemented in conjunction with a reduced number of annual drop-off collection events, in place of the collection events, or limited to only the elderly and disabled residents of the municipality. Some municipalities offer curbside collection of specific materials, such as waste oil.

A study conducted by the University of Maine for the Maine State Planning Office found that one-day collection events have the lowest cost, but also the lowest amount of HHW collected.

Permanent facilities have the lowest overall cost, but a relatively large amount of capital costs. In addition, the analysis found paints comprise roughly 50% of the total household hazardous waste collected by volume. The analysis also found that redirecting paint through reuse programs, such as a paint swap, could achieve significant cost reductions.<sup>55</sup> Costs for HHW collection vary by the type of program. For example, the King County Solid Waste Division found that the permanent facility and roving HHW collector cost an average of \$75/participant. However, residents utilizing the facilities are not charged a fee on site; rather these costs are funded through a surcharge on solid waste disposal and wastewater discharge.

### **Case Study: Curbside Collection of HHW**

#### **Denver, Colorado**

The City of Denver, Colorado (population 554,636; U.S. Census Bureau, 2000) has been offering curbside collection of HHW to residents for approximately four years through a contract with a local vendor. The program is funded through the City's stormwater management program.

Residents call the vendor's toll-free customer service phone number to schedule a pick-up and must have at least three different types of HHW materials for disposal. The contractor then sends the resident a collection kit which contains a heavy-duty clear plastic bag, instructions, labels and a cable tie that cannot be reopened once it has been secured. The bag of materials set out for collection cannot exceed 125 pounds. If the resident has more HHW than will fit in the bag, he or she may choose to set out the extra materials and pay for its collection.

The City pays the contractor \$104 per curbside stop and \$99 per resident using the drop-off option. The City budgets about \$200,000 annually for the HHW program, and spent approximately \$150,000 in 2004. Approximately 1% of the City's population currently participates in the program. In 2003, the City's vendor collected 122,000 pounds of HHW. From January through October 2004, the vendor collected approximately 144,442 pounds (110,834 pounds from the curb and 33,608 pounds at the drop-off site). In 2004 (January through October), the average pounds per curbside stop was 89, and the average drop-off amount was 124 pounds. The City of Denver opted for this type of program as an alternative to building a permanent HHW collection facility.

### **An HHW Collection Program for Sullivan County**

ANEI estimates that HHW composes an estimated one quarter to one percent of the waste stream.<sup>56</sup> ANEI estimates that Sullivan County generated approximately 185 tons or 370,000 pounds of household hazardous waste in 2005.<sup>57</sup> A 2006 survey conducted of over 350 residents in six Sullivan County towns found that 97% of respondents would support a permanent HHW collection facility.<sup>58</sup> (See Attachment D: *Results of March '06 Recycling Survey of Selected Sullivan County Towns.*)

ANEI proposes the construction of a new, centrally-located, permanent HHW collection facility (Depot), along with a roving collection vehicle (Rover) to serve the rural areas. We estimate that

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<sup>55</sup> Cost Analysis for Household Hazardous Waste Collection, February 2002. Andrew C. Files and George K. Criner, Department of Resource Economics and Policy, University of Maine, Orono, ME.  
[www.state.me.us/spo/recycle/docs/hhwcost.PDF](http://www.state.me.us/spo/recycle/docs/hhwcost.PDF)

<sup>56</sup> IBID

<sup>57</sup> 30,972 tons x 0.006 = 185 tons - based upon an average of 0.6 percent

<sup>58</sup> Towns which participated in the survey include: Acworth, Charlestown, Cornish, Lempster, Plainfield, and Unity.  
Antioch New England Institute, Antioch University New England, Keene, NH

the total annual capital and operating costs of these facilities would be approximately \$214,000-231,000.<sup>59 60</sup> These facilities would divert an estimated 176,000 pounds annually of hazardous waste from disposal facilities based upon per capita estimates from other HHW facilities across the country. The permanent facility would be designed to consolidate paint for local reuse – thus saving significantly on disposal costs. The facilities would also be open to small businesses that fall in the category of conditionally-exempt small quantity generators. (See Table 7: *Estimated Household Hazardous Waste Costs for Sullivan County*).

<b>Table 7: Estimated Household Hazardous Waste Costs for Sullivan County</b>				
<b>Capital Cost Estimate</b>				
	<b>Local Paint*</b>	<b>Rover</b>	<b>Depot</b>	<b>Total</b>
Capital Cost - Low	\$5,000	\$150,000	\$350,000	\$505,000
Capital Cost - High	\$10,000	\$200,000	\$500,000	\$710,000
Annual Capital Cost - Low	\$418	\$12,552	\$29,288	\$42,258
Annual Capital Cost - High	\$837	\$16,736	\$41,840	\$59,412
<b>Annual Operating Cost</b>				
Annual Operating Cost	\$14,697	\$27,365	\$130,428	\$172,491
Total Annual Cost - Low	\$15,116	\$39,917	\$159,716	\$214,749
Total Annual Cost - High	\$15,534	\$44,101	\$172,268	\$231,903

\* Local paint would be bulked, sold, and reused.

### **Residual Waste**

**Proposed Action:** Construct a new centralized transfer facility with the ability to consolidate waste materials for long-haul, out-of-county disposal. Contract with an out-of-county disposal facility to accept residual waste from Sullivan County towns.

<sup>59</sup> Assumes estimated annual participation levels of approximately 1,700 individuals for the permanent collection depot, 850 individuals for the roving facility, and 160 small businesses (conditionally exempt small quantity generators). Assumes an estimated collection of 3.7 pounds/person/year of which approximately 0.9 pounds/person/year would be reused for an estimated annual quantity of 176,544 pounds collected of which 40,355 pounds would be reused. Disposal costs for HHW are assumed at an average of \$0.34/pound. Capital costs assume annual interest rate of 5.5% over a 20 year period.

<sup>60</sup> It should be noted that less expensive alternatives are potentially available. For example, a permanent facility could consist of a steel butler building for storage of containers and an explosion-proof storage trailer that costs about \$20,000 brand new. Based upon experience of the several rural solid waste districts in Vermont, a rover can be purchased for \$25,000-40,000 for a fully-loaded box truck. Operational costs can be reduced by employing local operators who receive USEPA hazardous materials training. Latex paint can also simply be placed in a “swap” shop and not bulked – also potentially saving money.

As noted earlier, Sullivan County discarded approximately 27,000 tons of municipal solid waste in 2005, and this amount is expected to increase without significant new recycling programs in place. Notwithstanding new recycling, composting, and waste reduction initiatives, Sullivan County residents will still need a place to dispose of any residual waste – until the goal of “Zero Waste” can be achieved.

Currently, 12 of 15 Sullivan County towns take their waste to the Wheelabrator Claremont waste incineration facility. As noted earlier, the contract between the Wheelabrator Claremont and the Sullivan County Regional Refuse Disposal District expires in July 2007. The new contract proposed by Wheelabrator calls for a waste disposal tipping fee of \$92.00/ton, including guaranteed tonnage provisions.

Based upon interest from numerous Sullivan County towns, ANEI explored alternative waste disposal options. In August 2006, ANEI sent a letter of inquiry on behalf of ten Sullivan County communities to various waste disposal facilities in New Hampshire, Vermont, and New York.<sup>61</sup> ANEI received positive responses from seven of these facilities.

ANEI then developed estimated total costs for waste disposal alternatives by factoring in the disposal cost estimates provided by waste disposal facilities, the cost of hauling waste to these facilities, and the construction of a new central transfer station that would have the capacity to collect and consolidate solid waste from town transfer stations and waste hauling trucks. The analysis shows that Sullivan County towns have several economical alternatives for waste disposal compared to the proposed new contract price at Wheelabrator Claremont (as well as the current tipping fee of \$91/ton). ANEI found that Sullivan County towns could annually save \$150,000 - \$334,000 by sending their municipal solid waste to alternative disposal facilities - compared to the proposed contract price offer by Wheelabrator Claremont. The analysis focused on the most economical landfill disposal sites in Moretown, VT and Berlin, NH, as well as the proposed Hartland, VT landfill. Based upon a \$92.00/ton tipping fee that towns are currently paying, ANEI found that Sullivan County towns could save an estimated \$6.50 - \$14.50/ton -- depending upon the waste disposal site. (See Figure 5: *Analysis of Waste Disposal Options for Sullivan County* below.<sup>62</sup>)

It is important to note that any municipality sending waste to a Vermont disposal facility would be required to have a Solid Waste Implementation Plan (SWIP) approved by the

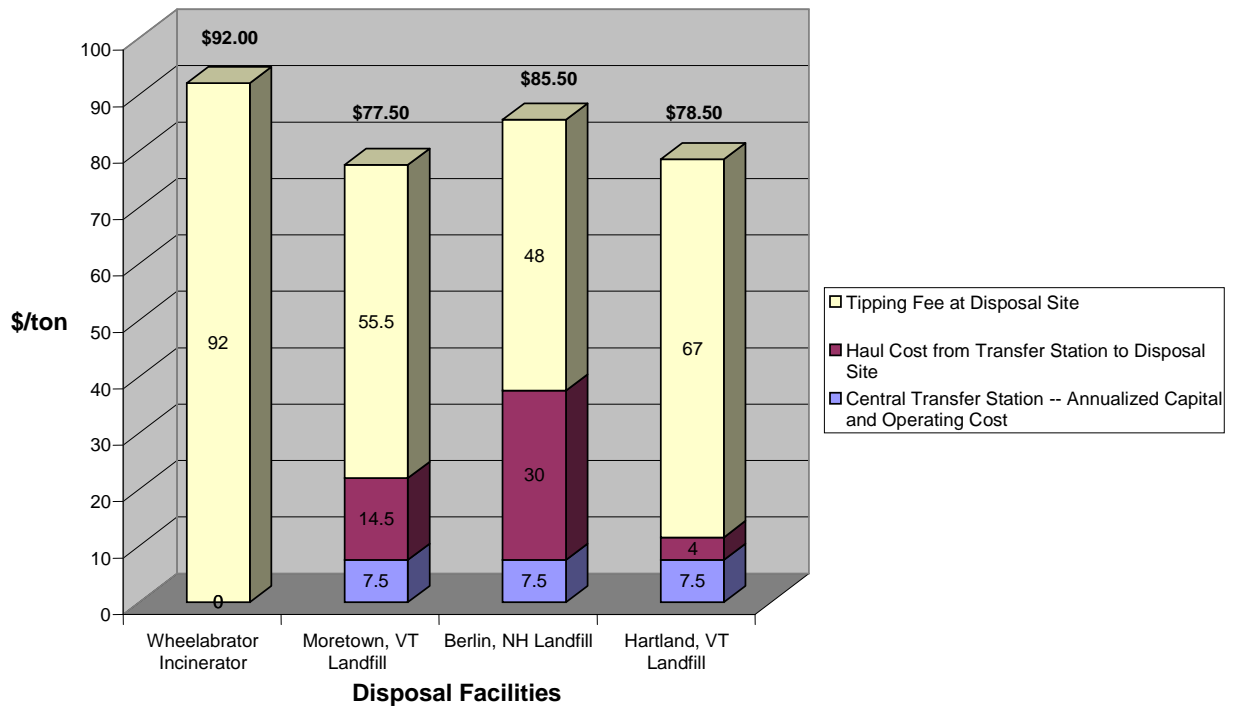
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<sup>61</sup> The letter of inquiry was sent on behalf of the following Sullivan County communities: Acworth, Charlestown, Claremont, Cornish, Croydon, Goshen, Lempster, Newport, Unity, and Washington.

<sup>62</sup> Assumptions include: *Transfer station costs* are based on a design capacity of 152 tons/day @ \$6,500-\$7,500/ton for total capital costs of approximately \$988,000 - \$1,140,000 financed over a 20 year period at 5.5% interest rate. Operating costs are estimated at \$2.50-3.50/ton at an estimated 19,238 tons/year for a total of \$49,400-\$69,100 per year. *Haul costs* from the central transfer station to out-of-county disposal facilities are based on an estimated cost of \$2.20-\$2.40 per mile using 100 cubic yard transfer trailers carrying loads of an estimated 20 tons/load. Per ton cost varies depending on distance to disposal facility. *Disposal facility tip fees* for Berlin, NH and Moretown, VT landfills are based upon responses received by ANEI to August 2006 letter of inquiry. Disposal facility tip fee for Hartland landfill facility is based upon October 2006 conversation between ANEI Project Director Paul Markowitz and Fred Moody, Manager of the Greater Upper Valley Solid Waste District. The Hartland landfill is not currently operational and is projected to go online within the next three-five years. Disposal costs for the Wheelabrator Claremont incineration facility are based upon proposed “Waste Disposal Agreement,” August 2006.

Vermont Department of Environmental Conservation. SWIPs document how the municipality will manage its waste and how it will achieve the State of Vermont waste diversion goals.<sup>63</sup> The Mt. Carberry landfill in Berlin requires that a town sending its waste to their facility must have an active recycling program. The facility does not accept hazardous waste and has a list of unacceptable materials.<sup>64</sup>

**Figure 5: Analysis of Waste Disposal Options for Sullivan County**



<sup>63</sup> "Solid Waste Implementation Plans: Guidance Document," 2006. Vermont Department of Environmental Conservation, Waterbury, VT. [www.anr.state.vt.us/dec/wastediv/solid/pubs/Guidoc1-2-02.pdf](http://www.anr.state.vt.us/dec/wastediv/solid/pubs/Guidoc1-2-02.pdf)

<sup>64</sup> Response from Sharon Gauthier to ANEI letter of inquiry, September 22, 2006. AVRRDD – Mt. Carberry Landfill, Berlin, NH.



## Chapter 3: Getting There

### Recommendations for Moving Forward

Sullivan County towns will need to implement a range of policy initiatives, make investments, and stimulate behavioral change among its citizens to achieve a 50% recycling rate within the next five years. ANEI proposes the following recommendations to move Sullivan County down this path, as detailed below.

***Local governments should declare waste reduction and recycling as waste management priorities.*** Local governments in Sullivan County should establish official town/city policies that promote waste reduction and recycling as priorities for managing waste. Both the general public and the private sector need to know that local government officials are serious in their intent and commitment to making recycling a reality in Sullivan County. This intent will help move Sullivan County out of the current “chicken and egg” situation it currently finds itself, i.e. no private business will make the necessary investments in recycling infrastructure without a clear sign that Sullivan County is serious about recycling. Local officials can set an example by maximizing waste reduction and recycling efforts in government operations. Further, they can adopt local ordinances to encourage and/or require certain types of recycling efforts by waste haulers, residents and businesses (as discussed in more detail below).

***Make recycling convenient by instituting curbside recycling collection.*** Studies nationwide have shown that convenience is one of the most important factors in getting people to recycle. In essence, the manner in which people have their waste collected needs to match how they have their recyclable materials collected. In Sullivan County, all residents who utilize drop-off waste transfer stations have easy and convenient access to drop-off recycling. Not coincidentally, the best recycling rates in Sullivan County are in communities with drop-off waste transfer and recycling centers. Currently, only the Town of Plainfield has curbside recycling collection through a private waste hauler under contract with the town. The contractor also provides curbside waste collection.

In larger communities, such as Claremont and Newport, residents and businesses predominately use private waste haulers to collect their solid waste. Unfortunately, haulers are not currently providing curbside recycling collection services – and the abysmal recycling rates in these communities are testimony to this lack of service. Sullivan County towns can significantly increase recycling by ensuring that all residents that are currently served by curbside waste collection also receive curbside collection of recyclable materials.

One approach that local governments can undertake that has been used successfully by towns elsewhere is to require haulers to offer recycling services as part of their conditions for receiving a waste hauling license. In this way, all residents who want access to recycling collection services will have it. (See Attachment J: *Sample Municipal Solid Waste Ordinances.*)

***Provide economic incentives for residents and businesses to recycle.*** Most residents in Sullivan County have very little incentive to recycle or reduce their waste for a variety of reasons. A 2006 survey of Sullivan County residents in six selected towns found that 75% of respondents

supported a “pay-as-you-throw” (PAYT) financing system for waste.<sup>65</sup> In many rural towns, waste disposal costs are paid principally through local property taxes. In larger communities, residences pay a flat monthly fee for waste collection no matter how much waste they dispose of. Communities throughout New Hampshire and the U.S. have found that a PAYT program (also known as unit-based pricing) provides customers with powerful incentives to reduce their waste, e.g. the less you generate – the less you pay. Further, PAYT is an equitable approach to paying for solid waste in that people who waste more – pay more. Most communities with PAYT charge residents a fee for each bag or container of waste they generate. For curbside programs, some towns have required waste haulers to structure fees depending on the service provided, i.e. waste haulers must offer lower rates to customers who generate less waste. For rural towns, shifting waste disposal costs from the tax base to the user can be a challenging prospect and should be undertaken with significant public education and involvement.

### **Case Study: Pay-As-You-Throw<sup>66</sup> Dover, New Hampshire**

The City of Dover, NH is a community of approximately 26,000 people on New Hampshire’s seacoast. The municipal landfill was closed in 1979, and at that time the city entered into a relationship with a private hauler for collection and disposal at a privately owned and operated landfill. The city collected approximately 24,000 tons of trash each year, of which approximately 11,000 tons were residential refuse.

Before 1989, Dover had no recycling program. Any and all trash residents wished to discard was left at the curb, and 3½ truck routes were needed to collect the refuse daily. The cost of refuse collection and disposal was escalating rapidly. Responding to citizen pressure, the Dover City Council created an ad hoc committee on recycling in the fall of 1989. The committee urged the immediate establishment of a drop-off recycling center designed to collect a wide range of materials. The recycling center opened in May 1990. It quickly became very popular and a source of civic pride. The recycling center was run initially as an all-volunteer effort. After a few months, the city hired a solid waste coordinator who began working in conjunction with the ad hoc committee and several city councilors to urge the establishment of curbside recycling and the bag and tag program, which was then unknown in northern New England.

Before implementing the programs, the City held three public meetings. These meetings were filled with heated vocal dissent. However, the Ad Hoc Committee convinced the public to accept these programs with a couple of basic premises. The first premise was that recyclable materials are a commodity, and anything that is disposed of in the landfill is waste. The committee argued that the costs for producing wastes should be borne by the user and that the costs of recycling, because of its social and environmental benefits, should be borne by the city.

In September 1991, the City began curbside collection of recyclables, and a month later the bag and tag program was implemented. In conjunction with the establishment of these programs, the City Council created a Citizen’s Solid Waste Advisory Committee responsible for overseeing these programs. Since the program was initiated, the City has had annual public meetings and has raised the price only once. Overall, the program has been well received by the community and has proven to be a very effective means of managing Dover’s solid waste.

The city no longer provides for the collection and disposal of private dumpsters. Commercial generators pay the fees associated with the collection and disposal. For the residents, payment of the collection and disposal of wastes is accomplished through the purchase of bags and/or adhesive tags. A special revenue fund was established to pay for the collection, disposal, and administrative costs associated with residential solid waste. The fees generated by the

<sup>65</sup> Survey of Selected Sullivan County Residents, March 2006. Antioch New England Institute, Keene, NH.

<sup>66</sup> U.S. Environmental Protection Agency. [www.epa.gov/payt/tools/ssdover.htm](http://www.epa.gov/payt/tools/ssdover.htm)

sale of the bags and tags go into this fund as revenue. The goal is to maintain a neutral fund balance that can sustain the program, but not to build a large balance.

Dover reduced its tonnage from 11,000 tons per year to 3,900 tons, and its solid waste/recycling budget from \$1.2 million to approximately \$878,000. The current recycling rate is well over 50 percent for the residential waste stream—despite it being strictly voluntary.

***Develop the necessary infrastructure.*** Sullivan County needs new infrastructure if recycling levels are going to be significantly increased. As noted earlier, there are no materials recovery facilities within 40 miles of Claremont with the capacity to sort and process recyclable materials. The cost of hauling unprocessed recyclable materials can be expensive. ANEI's economic analysis indicates that a new MRF centrally located in Sullivan County could be economically viable based upon the current tonnage of recyclable materials generated in the County. Further, a Sullivan County MRF could pull in recyclable materials from surrounding regions such as the Upper Valley area. Sullivan County would also greatly benefit from a new aerated windrow composting facility that would have the capacity to accept yard and food waste, as well as other commercial organic waste. Further, it is critical that Sullivan County divert the most toxic components of the waste stream – household hazardous waste – by creating a new permanent HHW collection center and roving vehicle that would travel to outlying communities. ANEI is also proposing the establishment of a reused building supply center in the county that would accept materials from building deconstruction projects. Local governments and economic development corporations could provide low-interest loans, business development planning, and other forms of assistance to help a business or non-profit organization develop and run the center.

***Undertake wide scale public education efforts.*** Public education is the underpinning of any successful recycling program. Educational efforts should be diverse, widespread, on-going and include informational brochures, media postings, and public information meetings. Public education efforts should be geared toward informing people about:

- ***True cost of waste disposal:*** Waste incineration and landfilling have external environmental costs that are not directly borne by the generator.
- ***How to recycle:*** The public needs to know what materials are acceptable for recycling and how to prepare recyclable materials for collection.
- ***How to reduce the toxicity and quantity of waste:*** The public needs to know how to purchase less toxic materials and how to reduce waste through reuse, recycling and composting.

***Eliminate economic disincentives.*** Communities should not be financially penalized for reducing their waste through recycling. Twelve of fifteen Sullivan County municipalities send their waste to the Wheelabrator Claremont incinerator under a contract that requires a guaranteed annual payment to Wheelabrator regardless of the amount of waste delivered. Any new waste disposal contracts should not contain guaranteed annual payment or guaranteed annual tonnage provisions.

***Work in partnership with the private sector.*** Currently, the private sector plays an active role in waste management in Sullivan County, particularly waste hauling. In all likelihood, the private sector will play a significant role in a new recycling-based resource management system. Potential roles include: collecting recyclable materials from residences and businesses, hauling waste and certain materials to out-of-county facilities, and constructing and building a new materials recovery facility and composting facility. Local governments should work closely with the private sector to share their vision on waste management for the county and how the private sector can play a role in achieving maximum waste reduction and recycling.

***Consider job creation impacts of recycling.*** According to the Institute for Local Self-Reliance (ILSR), sorting and processing recyclables alone sustain ten times more jobs than landfilling or incineration on a per-ton basis.<sup>67</sup> Recycling-based manufacturers employ more people and at higher wages than sorting and processing facilities. Some recycling-based paper mills and plastic product manufacturers, for instance, employ on a per-ton basis 60 times more workers than do landfills. Value is added to discarded materials as a result of cleaning, sorting, and baling. Manufacturing with locally-collected discards adds even more value by producing finished goods. For example, old newspapers may sell for \$30 per ton, but new newsprint sells for \$600 per ton. Each recycling step a community takes locally means more jobs, more business expenditures on supplies and services, and more money circulating in the local economy through spending and tax payments. ISLR estimates that reuse activities can generate up to 300 more jobs per 10,000 tons of waste than disposal, while recycling activities can generate 4-25 times more jobs. (See Attachment L: *Job Creation Impacts of Reuse/Recycling versus Disposal*.<sup>68</sup>)

***Explore range of options to finance the system.*** While recycling can save businesses and residences money, it also costs money. Recycling costs include collection of materials from residences and businesses, processing materials and transporting materials to market. However, the savings potential is enormous. As noted earlier, several Sullivan County towns are already tipping their recyclable materials at the Keene, NH MRF for \$0, while tipping fees at the Wheelabrator Claremont facility are \$91/ton. Our analysis shows that Sullivan County towns could reduce their current annual waste disposal bill by over \$1,000,000 just by increasing recycling levels from the current 13% to 50%. This is money that could be redirected and invested into a new infrastructure in Sullivan County for recycling, composting, waste reduction, and HHW management that would save residents money, create jobs and reduce pollution. In terms of capital requirements for any new facilities, towns will need to evaluate a range of financing options, including bonding, state appropriations, grants, and the involvement of the private sector in building and/or operating a new MRF.

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<sup>67</sup> Institute for Local Self-Reliance, Washington, DC.  
[www.ilsr.org/recycling/recyclingmeansbusiness.html](http://www.ilsr.org/recycling/recyclingmeansbusiness.html)

<sup>68</sup> Institute for Local Self-Reliance, Washington, DC, 1997. Figures are based on interviews with select facilities around the country. [www.ilsr.org/recycling/recyclingmeansbusiness.html](http://www.ilsr.org/recycling/recyclingmeansbusiness.html)

***Establish new organizational structure for addressing solid waste.*** The Sullivan County Regional Refuse Disposal District (SCRRDD) is the current regional entity with responsibility for managing solid waste for most of the County. With the upcoming dissolution of the NH-VT Solid Waste Project (SCRRDD comprises the NH part of the Project), the SCRRDD is currently undergoing significant changes. The SCRRDD has limited the scope of its activities over the past 20 years to waste disposal at the Wheelabrator Claremont waste incinerator. Given its history, there are serious doubts about the ability of SCRRDD to embrace a wholly new philosophy and approach to managing solid waste.

ANEI firmly believes that a new organizational structure is needed for addressing solid waste issues on a regional basis within Sullivan County. Given the history of the SCRRDD, it is unclear that any towns would embrace the formation of a new solid waste district with powers of taxation and bonding. However, it is clear that Sullivan County communities can benefit by coordinating their efforts to achieve cost-effective options for managing waste resources. A new organization is needed to promote waste reduction and to help communities share information and coordinate efforts.

***Consider issue of flow control and associated risks for municipal investments in solid waste.*** The U.S. Supreme Court has wrestled with the issue of flow control for the past 12 years. Flow control is a legal provision that allows state and local governments to designate the places where municipal solid waste (MSW) and recyclables are to be taken for processing, treatment, or disposal. Flow control can be essential for municipal investments in recycling and solid waste facilities because it can help ensure that the projected waste/recyclables needed to finance a particular facility are actually received.

The U.S. Supreme Court is again reviewing the legal ability of municipalities to enforce flow control requirements. A new ruling is not expected until sometime during the latter half of 2007. Thus, any new infrastructure investments, such as a new MRF, could be operating in a market economy wherein private haulers would be free to decide where to take their materials (essentially whichever facility offers the best price). Any proposal to publicly-fund a new recycling facility should take this risk into consideration.

## **Conclusion**

This *Recycling-Based Waste Management Action Plan* has been prepared to lay the foundation for building long-term sustainability for waste reduction and recycling programs in Sullivan County. ANEI encourages all individuals to use this document as a stepping stone to promote recycling and other waste reduction practices in their communities.

## **Attachments**

- A: Steering Committee Agendas**
- B: List of Steering Committee Members**
- C: Summary Table of Sullivan County's Waste and Recycling Collection Programs**
- D: Results of March '06 Recycling Survey of Selected Sullivan County Towns**
- E: Analysis of Alternative Solid Waste Management Systems for Sullivan County, NH: Steps and Timeframe**
- F: Solid Waste Programs and Facilities for Consideration in the Analysis of Alternatives**
- G: Cost of Waste Disposal for Sullivan County**
- H: Detailed Cost Analysis of Materials Recovery Facilities for Sullivan County**
- I: Preliminary Cost Estimates for an Aerated Windrow Composting Facility in Sullivan County**
- J: Sample Municipal Solid Waste Ordinances**
- K: Existing Management Practices and Costs in Sullivan County for Selected Special Wastes**
- L: Job Creation Impacts of Reuse/Recycling versus Disposal**
- M: Survey of Selected Materials Recovery Facilities in Vermont and New Hampshire**

## **Attachment A: Steering Committee Agendas**

### **A Recycling-Based Economy for Sullivan County, NH**

#### **Steering Committee Meeting**

**Wednesday, November 2, 2005 -- 7:00-9:00 pm**

**New Hampshire Technical College, Claremont, NH - Room 228**

- 7:00 Welcome and Project Overview**
- Brief project overview
  - Introductions of Steering Committee members
- 7:15 Updates/News**
- Cooperation with RCAP on USEPA grant
  - Other news
- 7:25 Roles and Responsibilities of Steering Committee**
- Review proposed roles/responsibilities
  - Meeting schedule/time commitment
  - Other proposed Steering Committee members?
  - Comments, questions, proposals
- 7:45 Project Workplan**
- Review milestones and timelines
  - Comments, questions, proposed revisions
- 8:00 Review Results of Advisory Committee meeting**
- Review charges of four working groups; Recycling/Waste reduction; Residuals; Toxics/Hazardous waste; public outreach/education
  - Comments, questions, suggestions
- 8:15 Risks/Challenges**
- Identify potential threats to the success of the project
  - Identify potential actions to address these threats
- 8:35 Upcoming Milestones**
- compilation of waste generation data
  - December public forum
- 8:45 Collaborative Activities**
- What can we do to make sure our efforts are taken seriously by Sullivan County towns?
  - Who should we be talking and consulting with?
- 8:55 Wrap-Up**
- review action items
  - set up next Steering Committee meeting
- 9:00 Adjourn**

## Waste Action Collaborative of Sullivan County

### Steering Committee Meeting

Monday, December 12, 2005 -- 7:00-9:00 pm  
New Hampshire Technical College, Claremont, NH - Room 212

### Agenda 12-08-05

- 7:00 **Welcome**
- Brief introductions of Steering Committee members
  - Brief overview of role of Steering Committee
- 7:10 **Updates/News**
- Dec. 6<sup>th</sup> Public Forum results
  - Working groups activities; working with City of Claremont
  - Working with RCAP and USEPA-funded project; Other news
- 7:25 **Setting A Recycling Goal**
- Littleton, Dover, and other NH communities have achieved 50% recycling (or better).
  - *Discussion item:* Should we set a recycling goal for the recycling-based waste management plan for Sullivan County? If so, what should it be?
- 7:35 **Reaching Out**
- Are we reaching the citizens of Sullivan County? Should we be going to the people versus asking them to come to us?
  - *Discussion item:* How can we be even more effective in getting the word out to people and getting them involved? Should we be participating in meetings of local civic organizations, selectboards, etc.?
- 7:50 **Waste Generation Data**
- Purpose/ value of the data; problems with existing data; plans to improve the data
  - *Discussion item:* Are we satisfied with the quality of the data we have for the purposes that we are going to use it for? If not, what steps should we take to improve data?
- 8:05 **Working Groups and Advisory Committee**
- Review role of workings groups and Advisory Committee
  - *Discussion item:* Are working groups being effective? What steps can we take to maximize the effectiveness of the working groups and Advisory Committee?
- 8:20 **Residuals Options**
- Results of visit to Hartland Landfill; proposed next steps
  - Other disposal options
  - *Discussion item:* Should we move forward in pursuing Hartland option, and if so, how best to do so?
- 8:40 **Pilot Recycling Grant Program**
- Review draft grant description
  - *Discussion item:* provide comments on grant description
- 8:55 **Wrap-Up**
- review action items
  - set up next Steering Committee meeting
- 9:00 **Adjourn**



## **Waste Action Collaborative of Sullivan County**

### **Steering Committee Meeting**

**Tuesday, January 17, 2006 -- 6:30-7:30 pm**  
**New Hampshire Community Technical College, Claremont, NH - Room 126**

### **Proposed Agenda**

- 6:30 Welcome**
- 6:35 News**
- Wheelabrator's new contract offer
  - Sullivan County Regional Refuse Disposal District vote
  - Work of the Legislative MRF Committee
  - Other?
- 6:45 Updates**
- Waste Action Collaborative of Sullivan County – our new name
  - Site assessments of transfer stations/recycling centers by NRRRA
  - Organizing a multi-town meeting re: Hartford landfill
  - Pilot recycling grants
  - Supplemental funding request to USDA
  - Moving ahead with the June 2006 Recycling Fair
  - Other?
- 7:05 Milestones and Timeline**
- Review of what we need to accomplish and by when
- 7:20 Organizing for Town Meeting Day**
- Using the upcoming town meeting day as an opportunity to educate residents and solicit opinions
  - Other opportunities presented by town meeting day
- 7:25 Wrap-Up**
- Review action items
  - Set up next Steering Committee meeting
- 7:30 Adjourn**

## Waste Action Collaborative of Sullivan County

### Steering Committee Meeting

Tuesday, February 28, 2006 -- 7:00-9:00 pm  
Sugar River Valley Regional Technical Center, Claremont  
TV Room

### Proposed Agenda

- 7:00 **Welcome and Check-Ins**
- 7:10 **News and Updates**
- Coordination with MRF Legislative Committee
  - Site assessments of transfer stations/recycling centers
  - Bus tour to Chittenden County
  - Pilot recycling grants status
- 7:25 **Waste Action Collaborative of Sullivan County: Governance and Roles**
- Relationship and respective roles between ANEI/RCAP Solutions and Steering Committee
  - Steering Committee as a coordinating body on solid waste issues in Sullivan County
  - Relationship of Steering Committee to Advisory Committees and working groups
  - *Action requested:* Discuss idea of Steering Committee taking more of a lead role in the project, forming an Executive Committee, appointing a Chairperson(s)
- 8:10 **Analysis of Solid Waste Alternatives**
- Developing the framework for the recycling-based waste action plan
  - Hiring a consulting to conduct analysis of alternatives
  - Organizing working meetings to select alternatives
  - Providing guidance to Advisory Committee and working groups
  - *Action requested:* Move forward with and set dates for series of facilitated working meetings
- 8:30 **Town Meeting Day Outreach**
- Update and solicit input on planned activities for town meeting day
  - Identifying a coordinator for each town in Sullivan County
  - *Action requested:* update; names of contacts
- 8:45 **Sullivan County Recycling Fair**
- Proposed plans for June Recycling Fair
  - *Action requested:* ideas for specific activities; how to reach out
- 8:55 **Wrap-Up**
- Review action items
  - Set date and time for next Steering Committee meeting
- 9:00 **Adjourn**

## Waste Action Collaborative of Sullivan County

### Memorandum

To: Steering Committee Members plus selected Advisory Committee members

From: Paul Markowitz, Project Director

RE: Upcoming Steering Committee meeting on April 25<sup>th</sup>

Date: March 23, 2006

Cc: Peter Engel, Patrick Pinkson-Burke, Jim Gruber

Dear Steering Committee members: I wanted to let you know that ANEI has hired Peter Engel, a Consultant based in Boston and who has taught solid waste at Antioch, to conduct an economic analysis of alternatives for solid waste management.

Attached please find a scope of work for your reference. As the first step in the process, we will be conducting a working session to conduct an initial screening of options and we would like to welcome you to participate. This work session will be held on Tuesday, April 4<sup>th</sup> from 7-9 pm at a location to be determined. The objective of the work session is to accomplish the following:

- Discuss major solid waste systems
- Revise exclusionary criteria as needed
- Eliminate non-viable systems
- Discuss waste stream components
- Revise ranking criteria and matrix for waste materials
- Evaluate and rank materials for diversion and disposal
- Describe Phase II evaluation process and present draft criteria
- Revise criteria and matrix for Phase II

Your presence is most welcome. We will also be conducting a second screening on the scheduled date for our next meeting on Tuesday, April 25<sup>th</sup>.

I will be traveling from March 25-April 5<sup>th</sup>; however, Jim Gruber will cover in my absence. Please let me know if you have any questions or comments. Best regards, Paul

## Waste Action Collaborative of Sullivan County

### Memorandum

To: Steering Committee Members plus selected Advisory Committee members

From: Paul Markowitz, Project Director

RE: Upcoming Steering Committee meeting on April 25<sup>th</sup>

Date: April 12, 2006

Cc: Peter Engel, Patrick Pinkson-Burke, Jim Gruber

Greetings all:

I hope this memo finds you well and enjoying the warm weather.

As many of you know, we are starting to reach a critical stage in the preparation of the recycling-based solid waste management plan for Sullivan County. At the April 4<sup>th</sup> Steering Committee meeting, ANEI Consultant Peter Engel guided participants through the first stage of the analysis of alternatives. This included identifying and defining major solid waste systems (e.g. collection, diversion, processing, transfer and disposal systems), identifying waste stream components (e.g. recyclable and compostable materials), and preparing draft criteria and a matrix for evaluating and ranking waste stream components. Please find the results from this work session enclosed.

The upcoming meeting on April 25<sup>th</sup> is the next critical step in conducting the analysis of alternatives. At this meeting, we will identify appropriate programs and facilities for viable major systems (e.g. practical and state-of-the-art options for rural and urban collection of recyclables targeting high ranking materials), establish performance parameters for programs and facilities (e.g. participation and capture rates, relative environmental impacts, and generic per ton costs and revenues), and prepare a preliminary matrix of options for further consideration.

We are inviting Steering Committee members and selected members of the Advisory Committee who have been active in our efforts to date. Your participation is truly valued. As a plus, we will be serving pie and coffee - so how do you pass that up?

Please let Mary Delahanty know if you are planning on attending or not. Her email is: [Mary\\_Delahanty@antiochne.edu](mailto:Mary_Delahanty@antiochne.edu). The meeting will be held in the TV room at the Claremont Sugar River Valley Technical Center on South Street from 7:00-9:00 pm. We will be starting on time.

I look forward to seeing you there.

**Waste Action Collaborative of Sullivan County**

**Steering Committee Meeting  
Tuesday, April 25, 2006 -- 7:00-9:00 pm**

**Claremont Middle School, Cafeteria, South St.  
(next to Sugar River Valley Regional Technical Center)**

**Proposed Agenda**

**Analysis of Solid Waste Alternatives**

- 7:00 Welcome, Introductions, and Agenda Review**
- 7:10 Analysis of Alternatives -- Review Overall Process**
- Review steps involved in conducting analysis
  - Questions and answers
- 7:30 Review Work to Date**
- Review results from April 4<sup>th</sup> session
  - Discussion
- 7:45 Review Options for Major Programs and Facilities**
- Overview of different options
  - Reach agreement on programs and facilities for consideration
- 8:00 Select Evaluation Criteria**
- Review potential criteria to be used in evaluating programs and facilities
  - Select priority criteria
- 8:30 Determine process for evaluating programs and facilities**
- Discuss level of quantification desired and/or needed
  - Involving the general public: when and how
  - Other important considerations
- 8:55 Wrap-Up**
- Next steps
  - Set date and time for next Steering Committee meeting
- 9:00 Adjourn**

## **Waste Action Collaborative of Sullivan County**

### **Steering Committee Meeting**

**Tuesday, May 6, 2006**  
**6:30 pm -- Pie and social**  
**7:00-9:00 pm -- meeting**

**Claremont Middle School, Cafeteria, South St.**  
**(next to Sugar River Valley Regional Technical Center)**

### **Proposed Agenda**

#### **Analysis of Solid Waste Alternatives**

- 6:30 Pie, Coffee, and Social Time**
- 7:00 Welcome, Introductions, and Agenda Review**
- 7:10 Quick Review of Process and Work to Date**
- Questions and answers
- 7:20 Review Options for Major Programs and Facilities**
- Review different options (see materials from Peter Engel)
- 7:40 Review Proposed Process for Narrowing Major Programs and Facilities**
- Review evaluation criteria identified at April 25<sup>th</sup> meeting
  - Review process for applying criteria to program and facilities for consideration
- 8:00 Narrow Major Programs and Facilities for Further Consideration**
- Conduct group process to narrow options
  - Review results
- 8:55 Wrap-Up**
- Next steps
  - Set date and time for next Steering Committee meeting
- 9:00 Adjourn**

## **Waste Action Collaborative of Sullivan County**

### **Steering Committee Meeting**

**Tuesday, October 3, 2006**

**6:30 pm -- Pie and social**

**7:00-9:00 pm -- meeting**

**Claremont Middle School, Cafeteria, South St.  
(next to Sugar River Valley Regional Technical Center)**

### **Proposed Agenda**

- 6:30 Pie, Coffee, and Social Time**
- 7:00 Welcome, Introductions, and Agenda Review**
- 7:10 Responses to Inquiry about Out-of-County Waste Disposal Options**
- Review responses and cost analysis
  - Review discussion among participating towns at the October 2<sup>nd</sup> meeting
  - Discuss next steps
- 8:00 Results of Economic Analysis of Alternatives**
- Review proposed scenarios
  - Review findings and cost assumptions
  - Questions and answers
  - Discuss next steps
- 8:45 Next Steps**
- Discuss plans for public information forums
  - Review schedule for completing action plan
  - Other?
- 8:55 Wrap-Up**
- Review action items from this meeting
  - Set date and time for next Steering Committee meeting
- 9:00 Adjourn**

## Attachment B: List of Steering Committee Members

### Waste Action Collaborative of Sullivan County

#### Steering Committee Members and Staff

September 2006

#### Steering Committee Members

Elizabeth Bedard, Executive Director  
Northeast Resource Recovery Association  
9 Bailey Road  
Chichester, NH 03258  
Phone: 603-798-5777; Fax: 603-798-5744  
E-mail: [nrraelizabeth@tds.net](mailto:nrraelizabeth@tds.net)

Deborah Cutts  
Claremont, NH  
Phone: 603-542-9536  
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Roger Formidoni  
14 Durham Avenue  
Claremont, NH 03743  
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E-mail: [formidoni@verizon.net](mailto:formidoni@verizon.net)

Bill Gallagher, Selectboard  
Town of Cornish  
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Cornish, NH 03745  
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Guenter Hubert  
179 Springfield Rd.  
Newport, NH 03773  
Phone: 603-863-4038  
E-mail: [ghubert@nhvt.net](mailto:ghubert@nhvt.net)

Virginia Irwin, Selectboard  
Town of Newport  
111 Beech Street  
Newport, NH 03773  
Phone: 603-863-3582  
E-mail: [peteandbid@nhvt.net](mailto:peteandbid@nhvt.net)

Vanessa Keith  
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Charlestown, NH 03603  
Phone: 603-543-0729

Katie Lajoie  
429 Wheeler Rand Road  
Charlestown, NH 03603  
Phone: 603-826-4803 (h); Phone: 603-271-3969 (w)  
E-mail: [KLajoie@dhhs.state.nh.us](mailto:KLajoie@dhhs.state.nh.us)

Duncan McCutchan  
RR 2 Box 472  
Claremont, NH 03743  
Phone: 603-543-0439  
E-mail: [jdmccutchan@verizon.net](mailto:jdmccutchan@verizon.net)

Ben Mortell  
356 Quaker City Road  
Unity, NH 03603  
Phone: 603-542-2466  
E-mail: [benleannemortell@netzero.net](mailto:benleannemortell@netzero.net)

#### Staff

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Patrick Pinkson-Burke  
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E-mail: [ppinkson-burke@rcapsolutions.org](mailto:ppinkson-burke@rcapsolutions.org)

#### Advisor

Jim Gruber, Executive Director  
ANEI  
40 Avon St.  
Keene, NH 03431  
Phone: 603-357-3122 x 336; Fax: 603-357-0718  
E-mail: [James\\_gruber@antiochne.edu](mailto:James_gruber@antiochne.edu)



**Attachment C:  
Summary Table of Sullivan County's Waste and Recycling Collection Programs<sup>69</sup>**

	<b>Acworth (SCRRDD)<sup>70</sup></b>	<b>Charlestown</b>	<b>Claremont (SCRRDD)</b>	<b>Cornish (SCRRDD)</b>	<b>Croydon (SCRRDD)</b>	<b>Goshen (SCRRDD)</b>	<b>Grantham (SCRRDD)</b>	<b>Langdon (SCRRDD)</b>
<b>Town Transfer Station and Recycling Center</b>	Yes	Yes	Yes	Recycling Center	Yes	Yes	Yes	Yes
<b>Drop off fee for MSW</b>	No	Yes			Yes	Yes	Yes	No
<b>Curbside pickup municipal</b>								
<b>Curbside pickup private haulers</b>		Gary's Gobin	Yes	Gobin, Gary's, GS Trucking	No	Yes	Yes	No
<b>Recycling:</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Single stream</b>								
<b>Commingled containers</b>	Yes	Yes	Yes	Yes	Yes			
<b>HHW collection</b>	With Keene	With Keene	With Upper Valley (2003)	With Upper Valley	Not recently	With Upper Valley	Not recently	With Upper Valley
<b>C &amp; D</b>	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
<b>White goods</b>	Yes	Yes				Yes		No
<b>Waste oil</b>		Yes	Yes	Yes		Yes		Yes
<b>Commodities</b>	Fiber			Fiber				
<b>Residuals</b>	Wheelabrator	Mt Carbury & Wheelabrator	Wheelabrator	Wheelabrator	Casella	Wheelabrator Casella	Wheelabrator Casella	Wheelabrator
<b>Compost</b>		Yes	Yes			Yes		
<b>Swap shop</b>		Yes				Yes	Yes	Yes

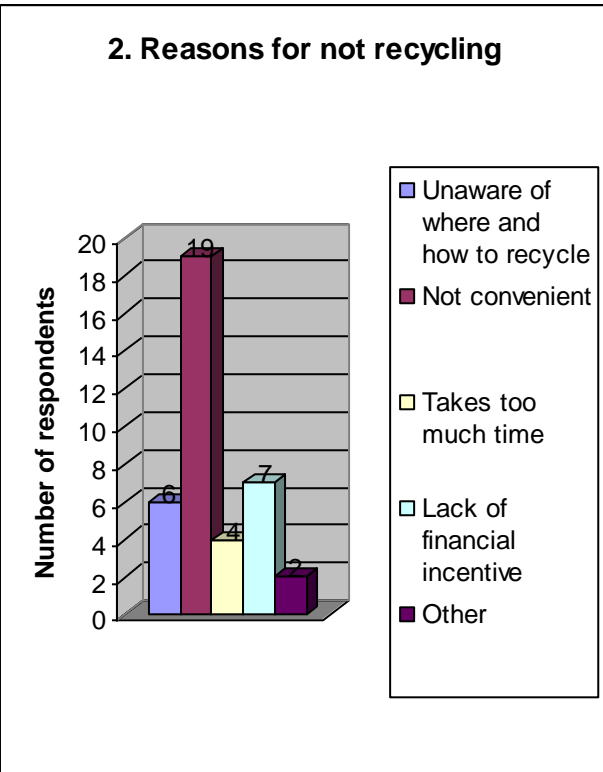
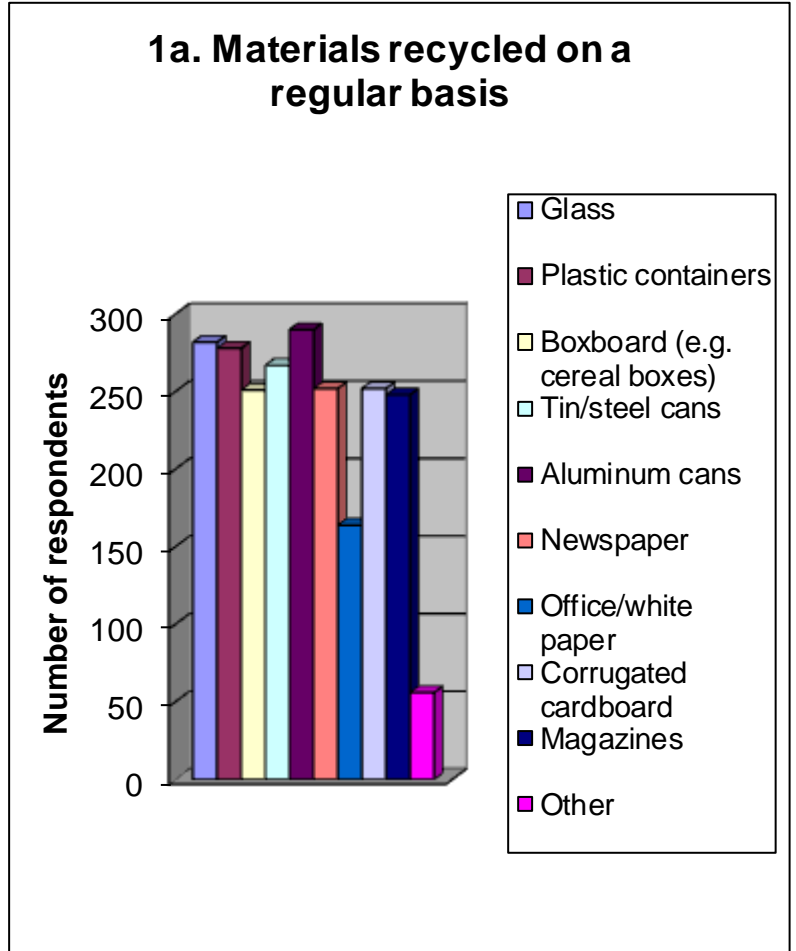
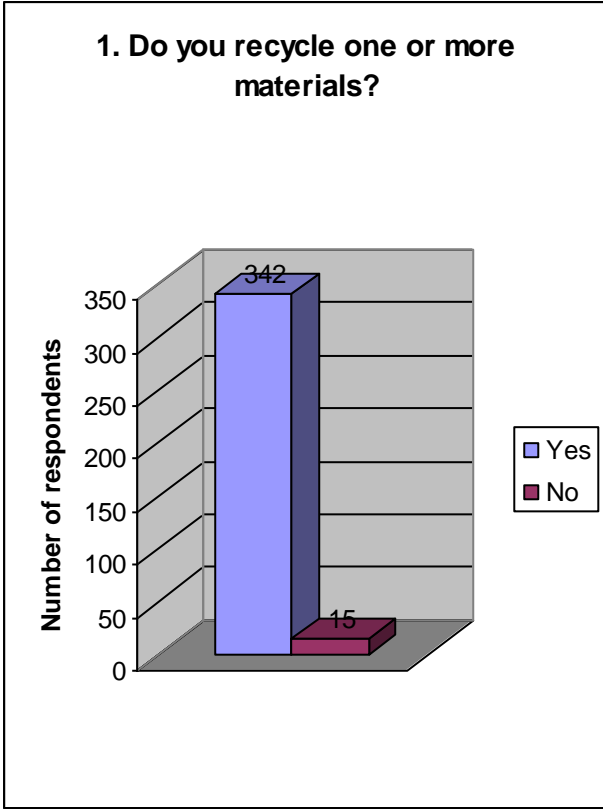
<sup>69</sup> Compiled by Interns Coleen Orsburn and Mary Delahanty, ANEI. 2005.

<sup>70</sup> Denotes membership in Sullivan County Regional Refuse Disposal District (SCRRDD)

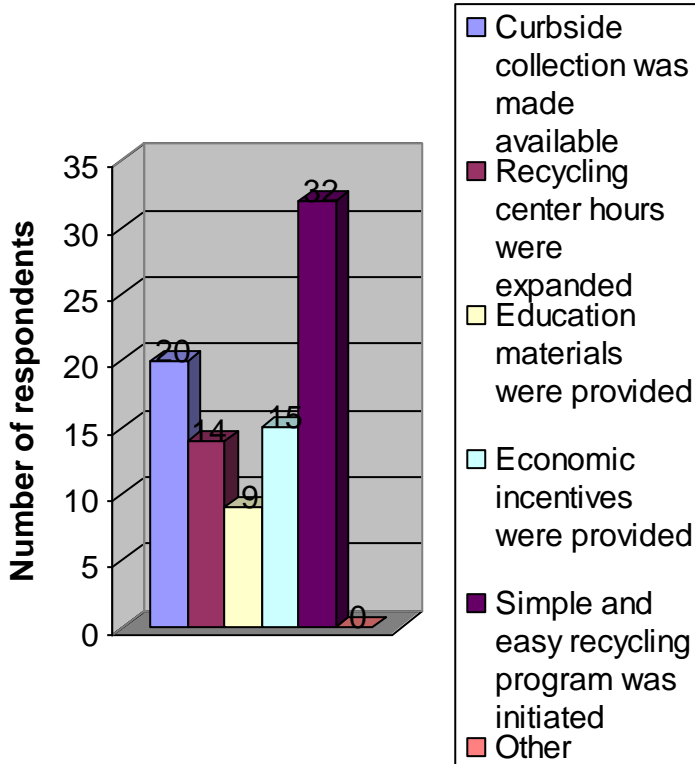
**Summary Table of Sullivan County's Waste and Recycling Collection Programs continued**

	<b>Lempster (SCRRDD)</b>	<b>Newport (SCRRDD)</b>	<b>Plainfield (SCRRDD)</b>	<b>Springfield (SCRRDD)</b>	<b>Sunapee (SCRRDD)</b>	<b>Unity</b>	<b>Washington</b>
<b>Town Transfer Station and Recycling Center</b>	Yes	No Private T.S or uses Claremont	Recycling Center	No Uses Sunapee	Yes	Landfill and Recycling Center	Yes
<b>Drop off fee for MSW</b>	No				No	No	No
<b>Curbside pickup municipal</b>			Yes			No	
<b>Curbside pickup private haulers</b>	Gobin Labounty	Gobin Gary's	Northeast (contract)		Yes	Gary's Labounty	
<b>Recycling:</b>	Yes	No	Yes	No Uses Sunapee	Yes	Yes	Yes
<b>Single stream</b>							
<b>Commingled containers</b>	Yes		Yes				
<b>HHW collection</b>	Through NRRRA	With Upper Valley	With Upper Valley	With Upper Valley	With Upper Valley	With Upper Valley	Yes
<b>C &amp; D</b>	Yes				Yes	Yes	Yes
<b>White goods</b>					Yes	Yes	
<b>Waste oil</b>	Yes				Yes	Yes	To Keene
<b>Commodities</b>	Yes	No	Yes		Yes	Yes	Yes
<b>Residuals</b>	Wheelabrator	Private Haulers	Northeast (2005)		Wheelabrator	Private haulers landfill	Mt. Carbury
<b>Compost</b>					Yes	No	Yes
<b>Swap shop</b>	Yes					Yes	Yes

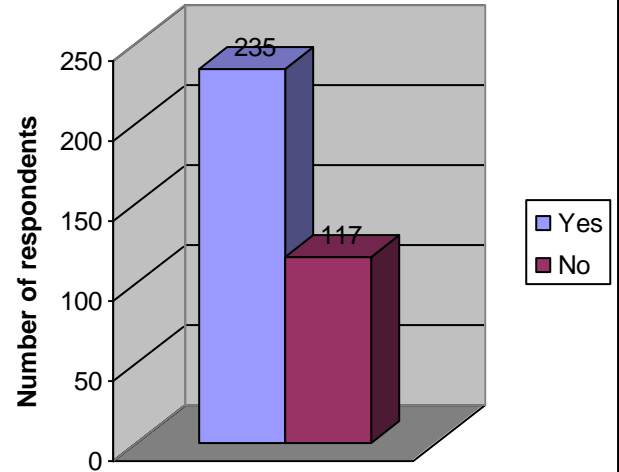
## Attachment D: Results of March '06 Recycling Survey of Selected Sullivan County Towns



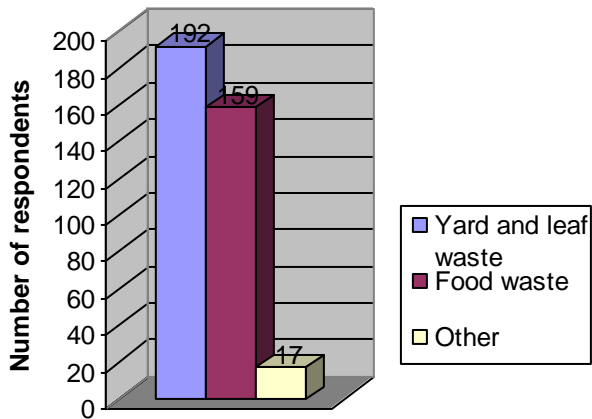
### 2a. Would be more likely to recycle if...



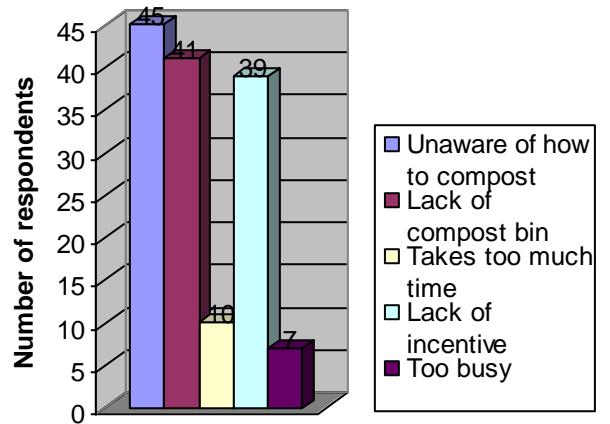
### 3. Do you compost any organic material?



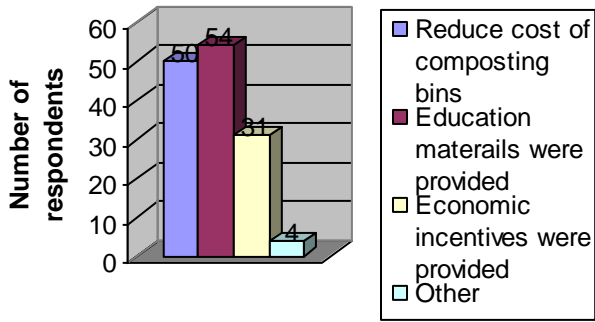
### 3a. Composted Materials



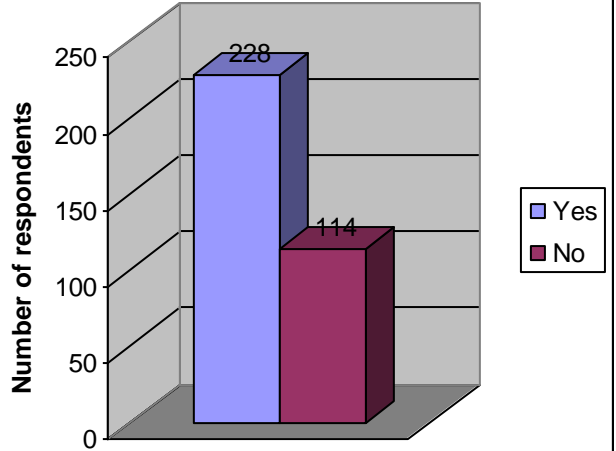
### 4. Waste is not composted because...



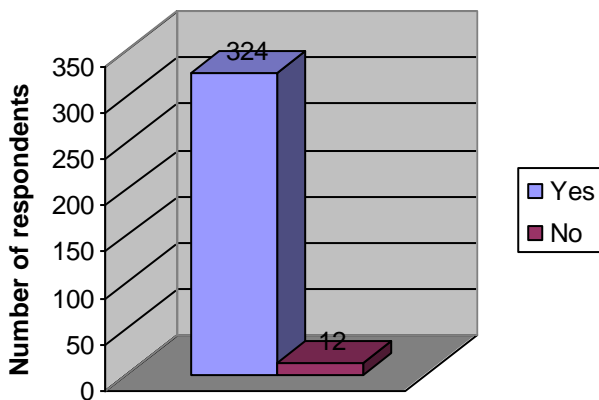
**4a. Would consider composting if...**



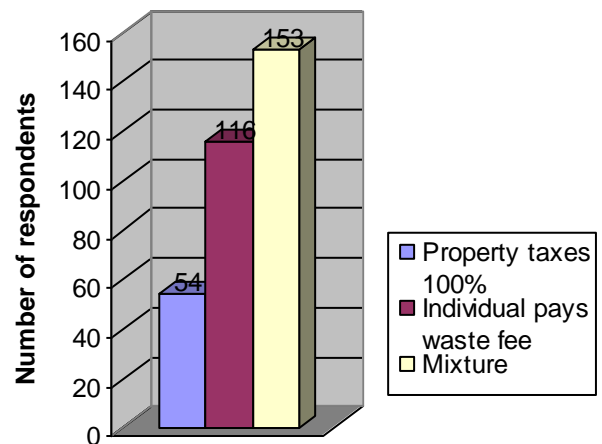
**5. Ever taken a HHW to a facility?**



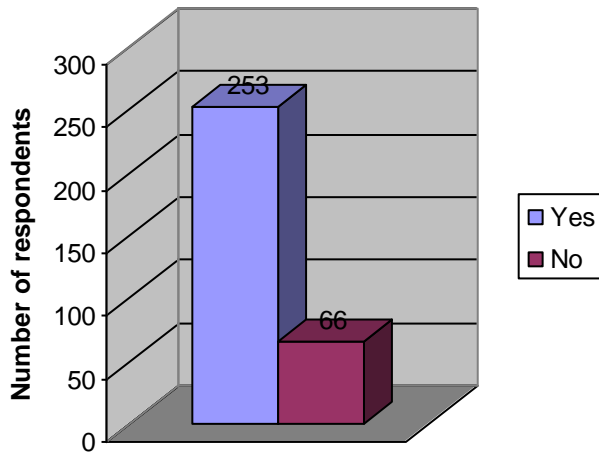
**5a. Do you believe it is important that Sullivan County residents have a special facility that accepts HHW?**



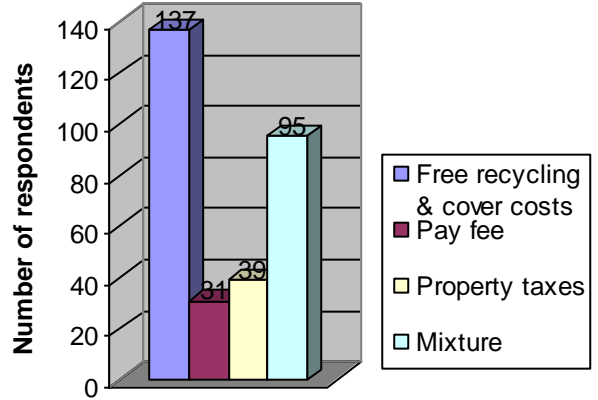
**6. Most appropriate way to pay for waste collection and disposal**



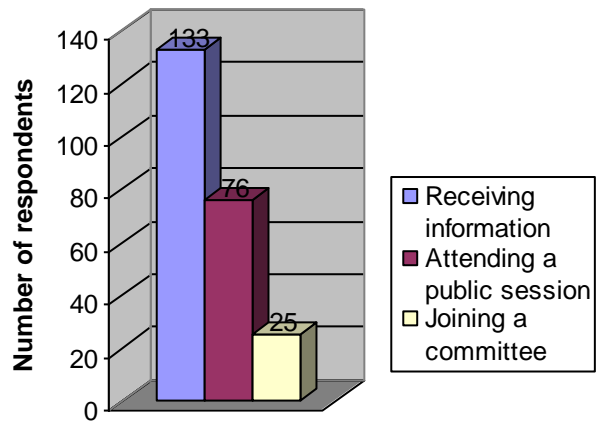
**7. Do you support "Pay-as-you-throw?"**



**8. The best way to fund recycling...**



**9. Would you be interested in...**



**Attachment E: Analysis of Alternative Solid Waste Management Systems for Sullivan County, NH:  
Steps and Timeframe**

Steps	Who	Timeframe
<b>Identify and define major solid waste systems for consideration (e.g. collection, diversion, processing, transfer and disposal systems).</b>	Steering Committee	April '06
<ul style="list-style-type: none"> <li>• Screen major solid waste systems.</li> </ul>		
<ul style="list-style-type: none"> <li>• Identify exclusionary criteria (economy of scale, site requirements).</li> </ul>		
<ul style="list-style-type: none"> <li>• Eliminate solid waste systems that are deemed unfeasible (e.g. new landfill in county).</li> </ul>		
<b>Select waste stream components for waste reduction (e.g. recyclable and compostable materials).</b>	Steering Committee	April '06
<ul style="list-style-type: none"> <li>• Identify materials for waste reduction.</li> </ul>		
<ul style="list-style-type: none"> <li>• Agree on criteria for ranking materials (ease of separation, quantity of, market value).</li> </ul>		
<ul style="list-style-type: none"> <li>• Select materials for waste reduction.</li> </ul>		
<b>Select programs and facilities for further consideration.</b>	Steering Committee	April '06
<ul style="list-style-type: none"> <li>• Identify specific technologies/programs (e.g. materials collection, materials recycling, organics recycling, solid waste transfer), education and training, incentives, and regulatory/enforcement programs.</li> </ul>		
<ul style="list-style-type: none"> <li>• Agree on criteria for evaluating programs and facilities.</li> </ul>		
<ul style="list-style-type: none"> <li>• Select programs and facilities for further consideration.</li> </ul>	Steering Committee? Sullivan County residents?	May '06

**Analysis of Alternative Solid Waste Management Systems for Sullivan County, NH  
Steps and Timeframe continued**

<b>Steps</b>	<b>Who</b>	<b>When</b>
<b>Develop two comprehensive integrated waste management systems for further analysis.</b>	Consultant	June '06
<ul style="list-style-type: none"> <li>• Calculate quantities diverted and disposed.</li> <li>• Define methods of collection, processing, and disposal.</li> <li>• Develop generic cost estimates.</li> </ul>		
<b>Refine and finalize integrated waste management systems.</b>	Sullivan County residents	June '06
<ul style="list-style-type: none"> <li>• Refine and finalize comprehensive integrated waste management systems.</li> <li>• Agree on parameters for the economic analysis.</li> </ul>		
<b>Conduct economic analysis.</b>	Consultant	July '06
<ul style="list-style-type: none"> <li>• Conduct economic analysis of two integrated waste management systems.</li> <li>• Determine life-cycle costs of program/facilities components and overall systems.</li> <li>• Determine projected cash flow requirements.</li> <li>• Conduct sensitivity analysis for certain parameter, e.g. rising fuel prices.</li> </ul>		
<b>Review and select integrated waste management system.</b>	Sullivan County residents, Steering Committee	September '06
<ul style="list-style-type: none"> <li>• Review findings of the economic analysis.</li> <li>• Revise and finalize system.</li> </ul>	Consultant	
<b>Prepare Recycling-Based Waste Management Plan.</b>		December '06



## **Attachment F: Solid Waste Programs and Facilities for Consideration in the Analysis of Alternatives**

### **Public Outreach, Education, and Training**

- Waste prevention and recycling outreach and education
- Municipal solid waste staff training

### **Incentives and Regulatory Approaches**

- Waste disposal bans on certain materials
- Mandatory recycling ordinances
- Pay-as-you-throw programs

### **Materials Collection Programs**

- Rural drop-off solid waste and recycling centers
- Curbside recycling collection – curbside sort
- Curbside recycling collection – 2- stream (fibers and containers separate)
- Curbside recycling collection – single stream (fibers and containers commingled)
- Curbside recycling collection for organic materials
- Curbside solid waste collection
- Co-collection of separated solid waste and single stream recyclables

### **Materials Processing Facilities**

- Limited processing at rural drop-off centers
- New centralized intermediate processing facility (IPF) (processing & marketing of source-separated materials only – no sorting)
- New centralized materials recovery facility (MRF) (sorting, processing & marketing of commingled materials)
- New centralized mixed waste processing facility (sorting of recyclables from mixed waste; processing and marketing of recyclables, and transfer of solid waste to disposal facility)
- Send recyclable materials to existing out-of-county MRF

### **Organics Processing Facilities**

- Backyard composting
- Rural drop-off yard waste composting facilities
- New centralized yard waste composting facility
- New centralized source-separated food and yard waste composting facility
- New centralized mixed waste composting facility

### **Solid Waste Transfer and Disposal Facilities**

- New centralized transfer station for out-of-county of solid waste
- De-centralized transfer stations for out-of-county of solid waste
- Wheelabrator waste-to-energy incinerator (Claremont)

### **C&D Waste Recycling Programs and Facilities**

- Jobsite separation program
- Send recyclable C&D to existing out-of-county facility
- New centralized wood waste recycling facility
- New centralized asphalt, brick & concrete (ABC) recycling facility
- C&D recycling outreach and education

<b>Attachment G: Cost of Waste Disposal for Sullivan County (2005)</b>			
<b>Sullivan County Municipalities</b>	<b>Waste Disposed in Tons (in 2005)</b>	<b>Tipping Fee*</b>	<b>Waste Disposal Costs</b>
Acworth	280	\$91	\$25,480
Charlestown	2,528	\$58	\$146,624
Claremont	13,445	\$91	\$1,223,495
Cornish	540	\$91	\$49,140
Croydon	268	\$91	\$24,388
Goshen	334	\$91	\$30,394
Grantham	1,282	\$91	\$116,662
Langdon	349	\$91	\$31,759
Lempster	589	\$91	\$53,599
Newport	4,215	\$91	\$383,565
Plainfield	910	\$91	\$82,810
Springfield & Sunapee	1731	\$91	\$157,521
Unity	169	\$15	\$2,535
Washington & Stoddard (Cheshire County)	430	\$58	\$24,940
<b>Total Tonnage</b>	<b>27,070</b>		
<b>Total Cost of Waste Disposal</b>			<b>\$2,352,912</b>

\*The following municipalities send their waste to the Wheelabrator waste incinerator located in Claremont, NH where the tipping fee is \$91/ton: Acworth, Claremont, Cornish, Croydon, Goshen, Grantham, Langdon, Lempster, Newport, Plainfield, Springfield, and Sunapee. Charlestown and Washington send their waste to the Berlin, NH landfill with a tip fee of \$42/ton plus an estimated \$16/ton hauling cost. Unity has its own landfill; tonnage cost based upon estimated cost of operating the landfill.

**Attachment H:  
Detailed Cost Analysis of Materials Recovery Facilities for Sullivan County**

**Cost Estimate - Single Stream**

	Quantity	Units	Unit Cost		Cost	
			Low	High	Low	High
<b>Construction Cost</b>						
MRF	82	tons/day	\$45,000	\$55,000	\$3,679,892	\$4,497,646
TS	152	tons/day	\$6,500	\$7,500	\$988,387	\$1,140,447
Total					\$4,668,279	\$5,638,093
Annualized Cost - MRF					\$307,931	\$376,360
Annualized Cost - TS					\$82,708	\$95,432
<b>Operating Cost</b>						
Operating Cost - MRF	10,631	tons/year	\$50.00	\$60.00	\$531,540	\$637,848
Operating Cost - TS	19,768	tons/year	\$2.50	\$3.50	\$49,419	\$69,187
Total Operating Cost					\$580,959	\$707,035
<b>Annual Cost</b>						
Annual Cost - MRF					\$839,471	\$1,014,208
Cost Per Ton - MRF					\$79	\$95
Annual Cost - TS					\$132,127	\$164,619
Cost Per Ton - TS					\$7	\$8
<b>Transfer Cost</b>						
MRF Residue	4,400	miles	\$2.00	\$2.20	\$8,800	\$9,680
MSW & Bulky Waste	35,160	miles	\$2.20	\$2.40	\$77,352	\$84,384
Total					\$86,152	\$94,064
<b>Tipping Cost (Recycling Revenue)</b>						
Recyclables	9,322	tons			(\$759,756)	(\$869,074)
MRF Residue	1,308	tons	\$62.00	\$62.00	\$81,116	\$81,116
MSW & Bulky Waste	19,768	tons	\$62.00	\$62.00	\$1,225,600	\$1,225,600
<b>Total Cost - MRF</b>					\$169,631	\$235,930
<b>Cost Per Ton - MRF</b>					<b>\$16</b>	<b>\$22</b>
<b>Total Cost - TS</b>					\$1,435,079	\$1,474,603
<b>Cost Per Ton - TS</b>					<b>\$73</b>	<b>\$75</b>

Recycling-Based Waste Management Action Plan for the Communities of Sullivan County, NH

<b>Cost Estimate - Dual-Stream</b>						
	Quantity	Units	Unit Cost		Cost	
			Low	High	Low	High
<b>Construction Cost</b>						
MRF	82	tons/day	\$40,000	\$50,000	\$3,271,015	\$4,088,769
TS	152	tons/day	\$6,500	\$7,500	\$988,387	\$1,140,447
Total					\$4,259,402	\$5,229,216
Annualized Cost - MRF					\$273,716	\$342,145
Annualized Cost - TS					\$82,708	\$95,432
<b>Operating Cost</b>						
Operating Cost - MRF	10,631	tons/year	\$40.00	\$50.00	\$425,232	\$531,540
Operating Cost - TS	19,768	tons/year	\$2.50	\$3.50	\$49,419	\$69,187
Total Operating Cost					\$474,651	\$600,727
<b>Annual Cost</b>						
Annual Cost - MRF					\$698,948	\$873,685
Cost Per Ton - MRF					\$66	\$82
Annual Cost - TS					\$132,127	\$164,619
Cost Per Ton - TS					\$7	\$8
<b>Transfer Cost</b>						
MRF Residue	2,400	miles	\$2.00	\$2.20	\$4,800	\$5,280
MSW & Bulky Waste	35,160	miles	\$2.20	\$2.40	\$77,352	\$84,384
Total					\$82,152	\$89,664
<b>Tipping Cost (Recycling Revenue)</b>						
Recyclables	9,915	tons			(\$801,965)	(\$917,731)
MRF Residue	715	tons	\$62.00	\$62.00	\$44,359	\$44,359
MSW & Bulky Waste	19,768	tons	\$62.00	\$62.00	\$1,225,600	\$1,225,600
<b>Total Cost - MRF</b>					<b>(\$53,857)</b>	<b>\$5,594</b>
<b>Cost Per Ton - MRF</b>					<b>(\$5)</b>	<b>\$1</b>
<b>Total Cost - TS</b>					<b>\$1,435,079</b>	<b>\$1,474,603</b>
<b>Cost Per Ton - TS</b>					<b>\$73</b>	<b>\$75</b>

<b>Attachment I: Preliminary Cost Estimates for an Aerated Windrow Composting Facility in Sullivan County</b>				
<b>Capital Cost Estimate</b>				
Item	Quantity	Units	Unit Cost	Total
Site Work (grading & pad)	2.5	acre	\$35,000	\$87,500
<b>Utilities (water supply/fire control)</b>				\$25,000
<b>Structures</b>				
Work Shed	1	ea	\$10,000	\$10,000
<b>Equipment (included in Annual Operating Cost)</b>				
Front End Loader	1	ea		
Tub Grinder	1	ea		
Trommel Screen	1	ea		
<b>Total Estimated Capital Cost</b>				\$122,500
<b>Engineering &amp; Contingency</b>	20%	of total		\$24,500
<b>Total</b>				<b>\$147,000</b>
<b>Operating Cost Estimate</b>				
<b>Labor</b>				
Equipment Operator	1360	hrs/yr	\$26	\$35,360
<b>Moving Equipment Lease</b>				
Front End Loader	500	hrs/yr	\$55	\$27,500
Tub Grinder	24	hrs/yr	\$150	\$3,600
Trommel Screen	120	hrs/yr	\$45	\$5,400
<b>Total Estimated Operating Cost</b>				<b>\$71,860</b>
<b>Annual Cost Estimate</b>				
Capital Cost	\$147,000			
Annualized Capital Cost	10	years @	5.50%	\$19,502
Operating Cost				\$71,860
<b>Total Annual Cost</b>				<b>\$91,362</b>
<b>Tons Per Year Handled</b>				<b>3,500</b>
<b>Cost Per Ton</b>				<b>\$26.10</b>

## **Attachment J: Sample Municipal Solid Waste Ordinances**

### **Sample Ordinance for Conditions of a Hauler's License**

Section 4.10(F). Except in situations where more than a 15-gallon container per week of one or more recyclables are generated, a licensed hauler may not require their customers to sort recyclables into more than two groups, one group of fibers and a second group of containers.

Section 4.10(J). No Licensee, and no Hauler who is not a Licensee, shall (i) knowingly collect or transport for disposal Solid Waste which has not been separated as required by Article III of this Ordinance, or (ii) co-mingle any such Solid Waste previously separated in the collection or transportation thereof. Any non-separated Solid Waste shall be rejected by the Hauler, who shall notify the Person generating such Solid Waste of the reasons for rejection. Any rejected Solid Waste shall remain the responsibility of the generating Person for delivery to a Facility authorized to receive it. However, at such time as the non-separated Solid Waste is collected by a Hauler, the Solid Waste becomes the concurrent, joint, and several responsibility of the generating person and the Hauler who collected the Solid Waste to deliver it to a Facility authorized to receive it. This provision shall not be construed as authorizing the collection or transportation of non-separated Solid Waste.

#### **Tiered Rate Schedule**

Section 4.10(G) of the Waste Management Ordinance requires a licensed hauler to offer tiered schedules to all of its customers, and to show in all customer billings fees for collection and handling of recyclables separately from fees for other solid wastes. Although the Ordinance does not establish the details of such a rate schedule, the tiered rate schedule must be based on different levels of service, thus creating a financial incentive for customers to generate less waste.

## **Sample Construction and Demolition Debris Ordinance**

### **An Ordinance of the Town of Atherton Adding a New Chapter 15.52 to the Atherton Municipal Code, Relating to Recycling and Diversion of Construction and Demolition Debris**

The City Council of the Town of Atherton, California, does hereby ordain as follows:

Section 1. A new Chapter 15.52 is hereby added to the Atherton Municipal Code, to read as follows:

#### **Chapter 15.52**

#### **Recycling and Diversion of Debris from Construction and Demolition**

##### **15.52.010 Findings and Purpose**

The City Council of the Town of Atherton hereby finds and determines that the Town is committed to protecting the public health, safety, welfare and environment; that in order to meet these goals it is necessary that the Town promote the reduction of solid waste and reduce the stream of solid waste going to landfills; that under California law as embodied in the California Waste Management Act (California Public Resources Code Sections 40000 et seq.), Atherton is required to prepare, adopt and implement source reduction and recycling elements to reach reduction goals, and is required to make substantial reductions in the volume of waste materials going to landfill, under the threat of penalties of \$10,000 per day; that debris from demolition and construction of buildings represents a large portion of the volume presently coming from Atherton, and that much of said debris is particularly suitable for recycling; that Atherton's commitment to the reduction of waste and to compliance with state law requires the establishment of programs for recycling and salvaging construction and demolition materials; the City Council recognizes that requiring demolition and construction debris to be recycled and reused may in some respects add modestly to the cost of demolition and in other respects may make possible some cost recovery and cost reduction; and that it is necessary in order to protect the public health, safety and welfare that the following regulations be adopted.

##### **15.52.020 Definitions**

For purposes of this chapter the following definitions apply:

A. "Contractor" means any person or entity holding, or required to hold, a contractor's license of any type under the laws of the State of California, or who performs (whether as contractor, subcontractor or owner-builder) any construction, demolition, remodeling, or landscaping service relating to buildings or accessory structures in Atherton.

B. "Construction" means all building, landscaping, remodeling, addition, removal or destruction involving the use or disposal of Designated Recyclable and Reusable Materials as defined in paragraph D below.

C. "Demolition and Construction Debris" means:

1. Discarded materials generally considered to be not water soluble and nonhazardous in nature, including but not limited to steel, glass, brick, concrete, asphalt material, pipe, gypsum, wallboard, and lumber from the construction or destruction of a structure as part

of a construction or demolition project or from the renovation of a structure and/or landscaping, and including rocks, soils, tree remains, trees, and other vegetative matter that normally results from land clearing, landscaping and development operations for a construction project.

2. Clean cardboard, paper, plastic, wood, and metal scraps from any construction and/or landscape project.
3. Non-construction and demolition debris wood scraps.
4. De-minimis amounts of other nonhazardous wastes that are generated at construction or demolition projects, provided such amounts are consistent with best management practices of the industry.
5. Mixing of construction and demolition debris with other types of solid waste will cause it to be classified as other than construction and demolition debris.

D. "Designated Recyclable and Reusable Materials" means:

1. Masonry building materials including all products generally used in construction including, but not limited to asphalt, concrete, rock, stone and brick.
2. Wood materials including any and all dimensional lumber, fencing or construction wood that is not chemically treated, creosoted, CCA pressure treated, contaminated or painted.
3. Vegetative materials including trees, tree parts, shrubs, stumps, logs, brush or any other type of plants that are cleared from a site for construction or other use.
4. Metals including all metal scrap such as, but not limited to, pipes, siding, window frames, door frames and fences.
5. Roofing materials including wood shingles as well as asphalt, stone and slate based roofing material.
6. Salvageable materials include all salvageable materials and structures including, but not limited to, wallboard, doors, windows, fixtures, toilets, sinks, bath tubs and appliances.

#### **15.52.030 Deconstruction and Salvage and Recovery**

Every structure planned for demolition shall be made available for deconstruction, salvage and recovery prior to demolition. It shall be the responsibility of the owner, the general contractor and all subcontractors to recover the maximum feasible amount of salvageable designated recyclable and reusable materials prior to demolition. Recovered and salvaged designated recyclable and reusable materials from the deconstruction phase shall qualify to be counted in meeting the diversion requirements of this chapter. Recovered or salvaged materials may be given or sold on the premises, or may be removed to reuse warehouse facilities for storage or sale. Title to recyclable materials forwarded to the operator of recycling facilities or of a landfill that is under contract to the cities in southern San Mateo County will transfer to the service provider upon departure of materials from the site.

#### **15.52.040 Diversion Requirements**

It is required that at least the following specified percentages of the waste tonnage of demolition and construction debris generated from every demolition, remodeling and construction project shall be diverted from going to land fill by using recycling, reuse and diversion programs:

Demolition:

- Fifty percent (50%) of waste tonnage including concrete and asphalt, and fifteen percent (15%) of waste tonnage excluding concrete and asphalt.



- Reroofing of homes with shingles or shakes as a separate project:
- Fifty percent (50%) of waste tonnage.
- Construction and Remodeling:
- Fifty percent (50%) of waste tonnage.

Separate calculations and reports will be required for the demolition and for the construction portion of projects involving both demolition and construction.

#### **15.52.050 Information Required Before Issuance of Permit**

Every applicant shall submit a properly completed "Recycling and Waste Reduction Form", on a form as prescribed by the Building Department, to the Building Department, as a portion of the building or demolition permit process. The form shall contain an accurate estimate of the tonnage or other specified units of construction and/or demolition debris to be generated from construction and demolition on the site. Approval of the form as complete and accurate shall be a condition precedent to issuance of any building or demolition permit.

#### **15.52.060 Deposit Required**

As a condition precedent to issuance of any permit for a building or a demolition permit that involves the production of solid waste destined to be delivered to a landfill, the applicant shall post a cash deposit in the amount of fifty dollars (\$50.00) for each estimated ton of construction and/or demolition debris, but not less than five thousand dollars (\$5,000.00). The deposit or cash bond shall be returned, without interest, in total or in proportion, upon proof to the satisfaction of the building official, that no less than the required percentages or proven proportion of those percentages of the tons of debris generated by the demolition and /or construction project have been diverted from landfills and have been recycled or reused. If a lesser percentage of tons or cubic yards than required is diverted, a proportionate share of the deposit will be returned. The deposit shall be forfeited entirely or to the extent that there is a failure to comply with the requirements of this chapter.

#### **15.52.070 Administrative Fee**

As a condition precedent to issuance of any permit for a building or a demolition permit that involves the production of solid waste destined to be delivered to a landfill, the applicant shall pay to the Town a cash fee sufficient to compensate the Town for all expenses incurred in administering the permit. The amount of this fee shall be determined in accordance with the then current resolution of the City Council determining the same.

#### **15.52.080 On Site Practices**

During the term of the demolition or construction project, the contractor shall recycle or divert the required percentages of materials, and keep records thereof in tonnage or in other measurements approved by the Building Department that can be converted to tonnage. The Building Department will evaluate and monitor each project to gauge the percentage of materials recycled, salvaged and disposed from the project. The required diversion of a minimum of the required percentages of the demolition and construction debris will be measured separately with respect to the demolition segment and the construction segment of a project where both demolition and construction are involved. To the maximum extent feasible on-site separation of scrap wood and clean green waste in a designated debris box or boxes shall be arranged, in order

to permit chipping and mulching for soil enhancement or land cover purposes. In order to protect chipping and grinding machinery, metal and other materials which cannot be chipped or ground shall not be placed in such boxes. On-site separation shall be undertaken for wallboard to the extent feasible on new construction.

#### **15.52.090 Reporting**

Within sixty (60) days following the completion of the demolition project, and again within sixty (60) days following the completion of the construction project, the contractor shall, as a condition precedent to final inspection and to issuance of any certificate of occupancy, submit documentation to the Building Department which proves compliance with the requirements of Section 15.52.040. The documentation shall consist of a final completed "Recycling and Waste Reduction Form" showing actual data of tonnage of materials recycled and diverted, supported by originals or certified photocopies of receipts and weight tags or other records of measurement from recycling companies, deconstruction contractors and/or landfill and disposal companies. Receipts and weight tags will be used to verify whether materials generated from the site have been or are to be recycled, reused, salvaged or otherwise disposed of. If a project involves both demolition and construction, the report and documentation for the demolition project must be submitted and approved by the Building Department before issuance of a building permit for the construction project. In the alternative, the permittee may submit a letter stating that no waste or recyclable materials were generated from project, in which case this statement shall be subject to verification by the Building Department. Any deposit posted pursuant to Section 15.52.060 shall be forfeited if the permittee does not meet the timely reporting requirements of this section.

#### **15.52.100 Violation a Public Nuisance**

Each violation of the provisions of this chapter shall constitute a public nuisance and be subject to abatement as such, pursuant to the provisions of Chapter 8.20 of this Code. The costs of abatement of any such nuisance shall be a lien upon the property involved.

#### **15.52.110 Penalties**

Each violation of the provisions of this chapter shall constitute a misdemeanor, and shall be punishable by imprisonment in the county jail for not to exceed six (6) months, or by fine not exceeding one thousand dollars (\$1,000.00), or by both such fine and imprisonment. Each day that a violation continues shall be deemed a new and separate offense.

Section 2. Except as hereby amended, said Atherton Municipal Code as amended shall be and remain in full force and effect.

Section 3. If any section, subsection, sentence, clause, phrase, or portion of this ordinance or the application thereof to any person or circumstances is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision and such holding shall not affect the validity of the remaining portions hereof nor other applications of the ordinance which can be given effect without the invalid provision or application, and to this end the provisions of this ordinance are declared to be severable.

Section 4. This Ordinance shall be posted in at least three public places within the Town of Atherton and shall be effective from and after thirty (30) days following its adoption.

## Attachment K: Existing Management Practices and Costs in Sullivan County for Selected Special Wastes

Waste/Resource Material	Marketed To or Through	Unit Cost (or Revenue)
<b>Automotive</b>		
<b>Waste Oil</b>	Advanced Liquid Recycling, burned in special waste oil burner on site	No cost
<b>Oil filters</b>	B. J. Rovners	Crushed onsite; \$.04/ lb revenue
<b>Tires</b>	Routhier & Sons, NRRA, Evergreen (Jewell)	Routhier – charge of app. \$100.00/ton NRRA –charge of \$2.30 each Evergreen - \$130/ton
<b>Antifreeze</b>	Antifreeze Technology Systems of Londonderry; Advanced Liquid	Antifreeze Tech. Systems - swap used antifreeze for recycled antifreeze for \$2.50 gallon; Advanced Liquid – charge of \$.75/gallon
<b>Lead-acid batteries</b>	Recycling Services in Claremont	.05 cents a lb.
<b>Household Related Wastes</b>		
<b>Pesticides</b>	Annual HHW collection through UVLSRPC	Under an annual contract
<b>Household chemicals/cleaning products</b>	Annual HHW collection through UVLSRPC	Under an annual contract
<b>Paint/related wastes</b>	Annual HHW collection through UVLSRPC	Under an annual contract
<b>Electrical Products</b>		
<b>Televisions (CRTs – cathode ray tubes)</b>	East Coast Electronics; NRRA	East Coast Electronics -- \$.10/ lb; NRRA - \$.15/lb
<b>Computers</b>	East Coast Electronics; NRRA	East Coast - \$.10 lb NRRA - \$.15/lb
<b>White goods/appliance</b>	B. J. Rovners; Advanced Recycling in Claremont	.05 lb revenue \$80/ton
<b>Cell phones</b>	Annual HHW collection through UVLSRPC	Under an annual contract

<b>Waste/Resource Material</b>	<b>Marketed To or Through</b>	<b>Unit Cost (or Revenue)</b>
<b>Other Special Wastes</b>		
<b>Fluorescent lamps/bulbs</b>	Annual HHW collection through UVLSRPC	Under an annual contract NRRA- about \$1/bulb
<b>Other mercury containing items</b>	Annual HHW collection through UVLSRPC	Under an annual contract
<b>NiCad batteries</b>	Annual HHW collection through UVLSRPC	Under an annual contract
<b>Propane tanks</b>	Rymes Heating Oils Antrim, NH; NRRA	Rymes – Free NRRA - \$1.20 each
<b>Freon recovery</b>	NRRA	\$7.00 per unit

## Attachment L: Job Creation Impacts of Reuse/Recycling versus Disposal<sup>71</sup>

Type of Operation	Jobs per 10,000 tons/year
<b>Product Reuse</b>	
Computer Reuse	296
Textile Reclamation	85
Misc. Durables Reuse	62
Wooden Pallet Repair	28
<b>Recycling-based Manufacturers</b>	25
Paper Mills	18
Glass Product Manufacturers	26
Plastic Product Manufacturers	93
<b>Conventional Materials Recovery Facilities</b>	10
<b>Composting</b>	4
<b>Landfill and Incineration</b>	1

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<sup>71</sup> Institute for Local Self-Reliance, Washington DC.

## Attachment M: Survey of Selected Materials Recovery Facilities in Vermont and New Hampshire February 2006

Information Requested	Materials Recovery Facilities			
	Chittenden County, VT	Windham County, VT	Rutland County, VT	Keene, NH
<b>A) Size of facility</b>	81,500 sq. ft.	15,450 sq. ft.	60,700 sq. ft.	90,000 sq. ft.
<b>B) Facility Ownership/Operation</b>	Owned by Chittenden County Solid Waste District; managed by Casella Waste Management	Owned by Windham County Solid Waste District; Operated by Windham Solid Waste District	Owned by Rutland County SWD; operated by Casella	Owned and operated by City of Keene
<b>C) Population served</b>	150,000 people	34,000 people	48,000 people in District; MRF accepts material from other regions	50,000 people
<b>D) Initial Capital Costs</b> <ul style="list-style-type: none"> <li>• Building-related costs</li> <li>• Equipment-related costs</li> </ul>	Combined: \$2.1 M (Original + Conversion)	\$1.5 M bldg includes District offices. \$696,000 equipment \$ 90,000 glass processing All 1994 dollars	\$1.4 M initial land, building; \$900,000 new equipment, \$352,000 building retrofit 1994 Operations began in 1995	Site work \$1.4 M; equipment - \$500,000 in 1994 dollars
<b>E) Annualized capital costs [2005]</b>	\$101,000	\$73,000	\$230,000	\$230,000
<b>F) Annual O&amp;M costs [2005]</b>	\$1,574,000	\$463,000	N/A	\$312,000
<b>G) Total Annualized Costs [2005] [Rows E + F]</b>	\$1,675,000	\$536,000	\$230,000	\$542,000
<b>H) Tons of recycled materials processed [2005]</b>	35,000 tons	7,000 tons	10,000 tons	7,370 tons
<b>I) Cost per ton to operate[2005] [Row G/H]</b>	\$47.85	\$76.57	N/A	\$73.50
<b>J) Facility Capacity [tons/hour]</b>	20 tons/hour; 160 tons/day	5 tons/hour	8-9 tons/ hour	4.8 tons/hour
<b>K) Underutilized/available</b>	Plenty; willing to run extra shifts to accommodate increased tonnage	Could double processing with a second shift	4.5 tons/hour	1.25 tons/hour for current 8 hour shift; limits on container processing only

Recycling-Based Waste Action Management Plan for the Communities of Sullivan County, NH

<b>Information Requested</b>	<b>Chittenden County, VT</b>	<b>Windham County, VT</b>	<b>Rutland County, VT</b>	<b>Keene, NH</b>
<b>L) Accepting recyclable materials from other regions/towns?</b>	Yes	Yes	Yes	Yes
<b>M) Tipping fee charged (if any)</b>	\$27/ton \$13/ton – if you don't cherry-pick; \$38 and \$24 for non-member towns; District anticipates charging no tip fee in the near future	\$25/ton for out of district materials – will probably be increasing	50/ton source separated; \$90/ton commingled	-\$0-
<b>N) Revenue sharing arrangements (if any)</b>	50-50	None	Towns get full revenue back.	-\$0-
<b>O) Types of recyclable materials accepted: special considerations, if any (e.g. minimum contamination requirements)</b>	Standard list. Max of 2% contamination. Plastic bottles only but planning to expand to other plastics	Commingled fibers Commingled containers, no #3-7 plastics	Standard list	Standard list; OCC and mixed paper stream
<b>P) Single stream facility, two stream, other?</b>	Single stream	Dual stream	Dual stream and source separated	Dual stream

Recycling-Based Waste Action Management Plan for the Communities of Sullivan County, NH

Information Requested	Chittenden County, VT	Windham County, VT	Rutland County, VT	Keene, NH
<b>Q) Brief description of operations (level of mechanization, manual labor)</b>	Mechanized: <ul style="list-style-type: none"> <li>• OCC</li> <li>• Fiber/Container Sort</li> <li>• Glass</li> <li>• Ferrous</li> </ul> Manual: <ul style="list-style-type: none"> <li>• Fiber grades</li> <li>• Containers</li> </ul> No optical sorting (yet)	Hand sort to #8 news & corrugated cardboard  Ferrous magnet, hand sort #1/2 plastics, eddy current for aluminum, glass is ground for aggregate	Two picking lines; hand sort for containers and fiber	Hand sort for containers; magnetic for ferrous Glass used for aggregate
<b>R) Pay-as-you throw in effect?</b>	Minor	In some towns	Most towns have some sort of PAYT	Have ordinance in effect re: PAYT – but haulers offer limited price differential to encourage reduction in volume. All costs borne directly by residents/businesses for solid waste/recycling.
<b>S) Flow control in effect?</b>	No	No	No	No
<b>T) Other relevant information</b>	Planning to reduce or eliminate tip fees within the next year for recyclable materials; tied to the price of recyclable materials.	Recycling within the District is 34%	District also provides following services: HHW collection; C&D collection and grinder; yard waste collection and grinder; universal waste collection; tires, waste oil	Recycling revenues currently exceed operational costs. Estimates a diversion rate of 20-25% 5% contamination levels