

Household Hazardous Waste & Small Quantity Generator Hazardous Waste

Reviewing Options For
Sullivan County Communities



September 2009

This document provides a review of potential management options for household hazardous wastes and small quantity generator hazardous waste for the communities of Sullivan County, New Hampshire. This review begins with a general overview of household hazardous, small quantity generator, and universal wastes along with definitions of toxic/poison, flammable, corrosive/caustic, and explosive/reactive substances for those not familiar with these terms. It reviews some current costs information for these options along with a matrix of comparing each of the eight options. This document ends with a list of sources for those interested in implementing one or more of these potential management options.

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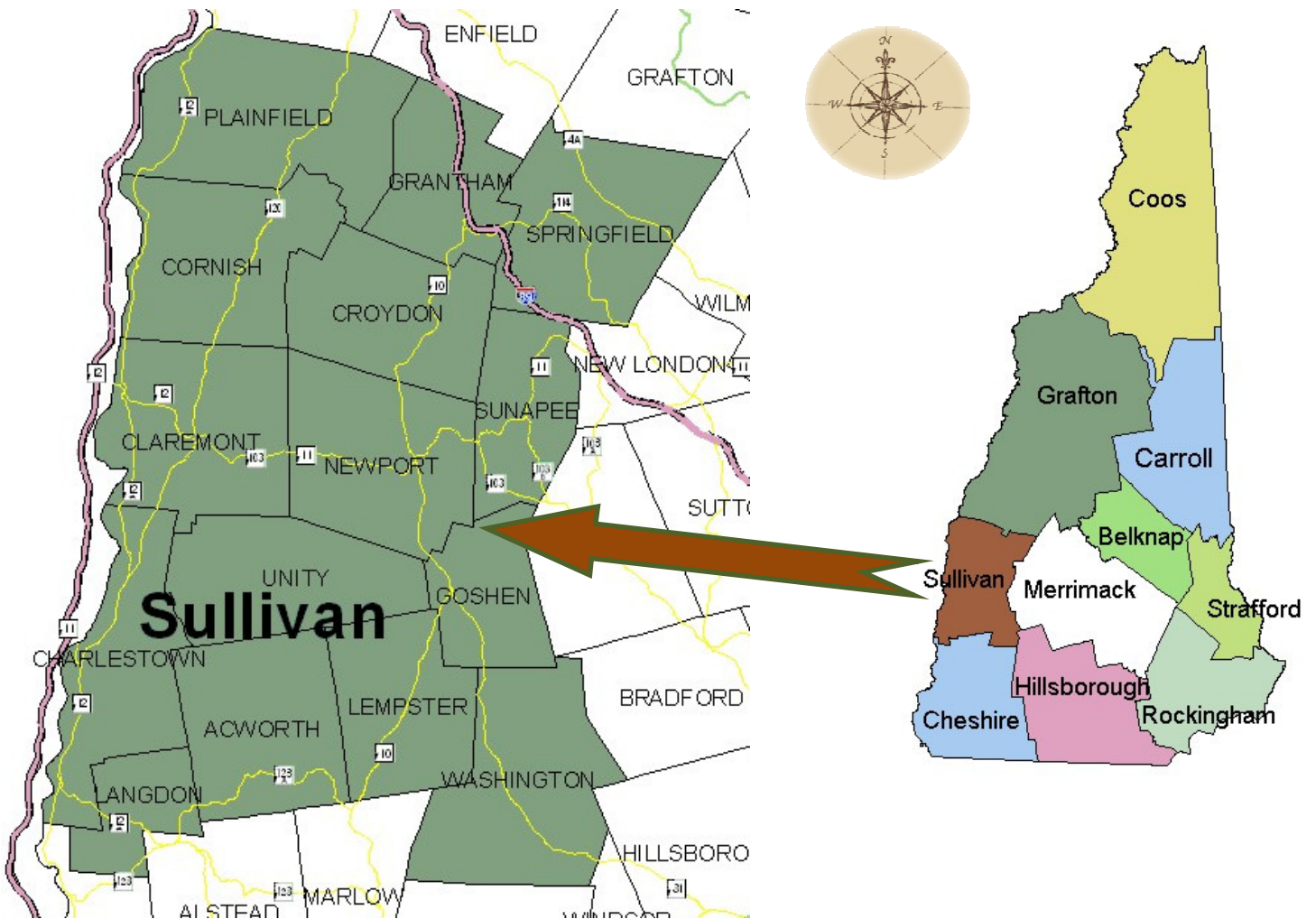
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Sullivan County



In 2008 the population of Sullivan County was 42,061 people. Sullivan County is located in the southwestern quadrant of New Hampshire. Sullivan County covers an area of 528 square miles and is home to fourteen towns (Acworth, Charlestown, Cornish, Croydon, Goshen, Grantham, Langdon, Lempster, Newport, Plainfield, Springfield, Sunapee, Unity, Washington) and one city (Claremont).

New Hampshire State Household Hazardous Waste Program

New Hampshire has an entire program dedicated to Household Hazardous Waste (HHW). This program's main goal is to alter the way cities, towns, and homeowners purchase, use, and dispose of household hazardous commodities and to reduce the quantity of hazardous products purchased. The Department of Environmental Services (DES) provides approximately \$200,000 of grant funds per year to support HHW collections by local government. DES has also established a HHW Special Projects Grants program to support activities that will reduce the volume or toxicity of HHW or the creation/enhancement of a permanent HHW collection and management infrastructure. (New Hampshire DES, 2008)

New Hampshire's population has doubled since 1970. As a result there has been a significant increase in HHW both purchased and inappropriately disposed of. Commonly purchased products include cleaning supplies, solvent based paints, and certain pesticides. Although these products may meet short-term needs for consumers, they can cause long-term hazardous consequences that most customers are not informed of. (New Hampshire DES, 2008)

Indicator of a Hazardous Product

The following are warnings and symbols that indicate a hazardous product:

TOXIC/POISON

If this substance is swallowed, absorbed, or inhaled it may cause bodily harm or loss of life. (Official City of Raleigh Website, 2008)



FLAMMABLE

This substance can catch fire due to another heat source such as a hot surface, spark, or flame. (Salt Lake Valley Health Department)



CORROSIVE/CAUSTIC

This substance can cause various burns, tissue loss, and deterioration. (Alameda County Waste Management Authority & Source Reduction and Recycling Board, 2009)



EXPLOSIVE/REACTIVE

If exposed to pressure or heat this substance can detonate. (Salt Lake Valley Health Department)

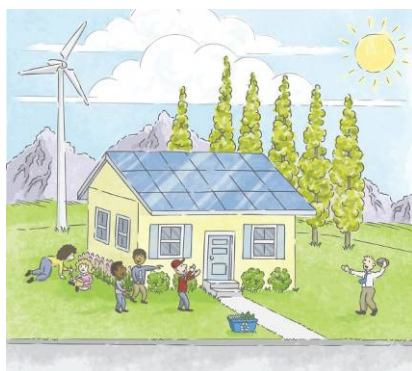


The New Hampshire State HHW program is educating consumers about the harmful effects of these products and the chemical nature of these products when mixed with other household materials through intentional or non-intentional use, storage, and disposal. The program educates the public both through the internet and through funding HHW collection events in New

Hampshire. They also encourage residents to use alternative, non-toxic products. (New Hampshire Department of Environmental Services, 2008)

Households vs. Small Quantity Generators

Households



Households are individuals who purchase hazardous products for personal or commercial use. Households can include those who reside in or use apartments, condo units, hotel rooms, parks, ranger stations, bunk houses, camp grounds, and play grounds. Household Hazardous Wastes are generated when these individuals have unwanted or leftover materials from the products purchased. Often these products include solvent-based paint, pesticides, oil, and various cleaning supplies. Improper use and disposal of these products goes unregulated, which can cause contaminated ground water and soil that eventually leads to the deterioration of the environment and human health. (New Hampshire DES, 2008)

Small Quantity Generators

New Hampshire's definition of Small Quantity Hazardous Waste Generators is a business that generates under 100 kilograms (220 pounds) of hazardous waste on a monthly basis. These can be part of a personal business, trust, firm, or joint stock company, corporation, the United States government, partnership, association, state trade, municipal job, commission, non-profits, and other agencies that have political influence. (New Hampshire DES, 2008)



New Hampshire requires Small Quantity Hazardous Waste Generators to submit to the Department of Environmental Services every three years in order to comply with New Hampshire's regulation RSA 147-A:5, IV. A self-certification program is currently held. More instructions can be found on <http://des.nh.gov>. (New Hampshire DES, 2008)

Household and Small Quantity Generators Hazardous Waste

Each year the average household throws away an average of 7.03 kilograms (15.5 pounds) of hazardous waste. (New Hampshire DES, 2003) This waste is then incinerated, placed in a landfill, or composted. Although it may seem that this hazardous waste is appropriately managed, it is possible that harmful emissions travel by air, runoff introduces pollutants into the ground and eventually water supplies, garbage seeps out into the environment, and trash spills occur. (Morrison, Gruber, & Chaliace, 1997)

Unfortunately, household and small quantity generator hazardous waste is sometimes improperly disposed with common garbage. This can create a hazard that slowly seeps into the environment either acting as a solo contaminant or as a pollutant mixed with other harmful materials. (New Hampshire DES, 2003)

Materials such as motor oil and pesticides are often discarded into sink drains, discharging to private septic or public sewer systems. Since oil is both a flammable and a reactive substance it can start fires, cause toxic fumes, and even explode if mixed with other substances. This can cause injuries to workers handling the trash and can indirectly harm residents in the surrounding area. (New Hampshire DES, 2003)



- ✚ A single pint of oil that travels into a lake can cause an oil slick one acre in size. (City of Chicago Used Motor Oil Recycling, 2008)
- ✚ A quart of oil can contaminate 250,000 gallons of groundwater. (County of LA, 2008)
- ✚ Forty percent of Superfund sites were landfills that accepted HHW. (Morrison, Gruber, & Chaliace, 1997)

Since these products are hazardous in nature they can also cause injury to the consumers who purchase them. Consumers face dangers such as: burns, respiratory illness, optical illness, neurological disease, headaches, nausea, dizziness, confusion, weakness, irritability, tremors, convulsions, cancer, birth defects, and even death. Hazardous products cause serious long-term and short-term problems for human beings, wildlife, and the environment. (New Hampshire DES, 2003)

Universal Waste and Household Hazardous Waste

There are four different categories (toxic/poison, flammable, corrosive/caustic, and explosive/reactive) of hazardous waste. These wastes have also been grouped into two categories based upon NH regulations as universal wastes and household hazardous wastes. These are briefly described below. Specific legal definitions are available through the citation provided under each category.

Universal Waste:



Commonly discarded materials identified by the Environmental Protection Agency which are required to be collected, stored, and processed, and not regularly disposed of. New Hampshire Universal Wastes are: florescent lamps, mercury containing devices (thermostats, thermometers, etc.), antifreeze, cathode ray tubes (CRTs), some batteries, and certain pesticides. (New Hampshire DES, 2008)

Household Hazardous Waste:

Left over domestic merchandise that has combustible, poisonous, explosive, and/or flammable properties. (New Hampshire DES, 2008)



Purchasing, Storage, and Safe Use of Household Hazardous Products and Small Quantity Generator Materials

We discourage the purchase of hazardous products or materials, residuals of which will become Household Hazardous Waste or Small Quantity Generator Wastes. However, if these materials are purchased, the following purchasing and use “common sense” guidelines are suggested.



Purchase wisely.

- + Buy non-hazardous or less hazardous products.
- + Avoid purchasing unnecessary hazardous products.
- + Only buy the quantity needed to perform the task at hand.

Store hazardous materials safely.

- + Close lids to prevent leaks and evaporation.
- + Store items in a cool, dry space.
- + Place away from heat sources.
- + Store products within the original container with clear labels.
- + Store flammables, toxins, corrosives, and explosive products in separate safe storage areas.
- + Store corrosive or deteriorating packaging within a glass or plastic container surrounded by cat litter or vermiculite, and immediately bring to a collection facility or event.

Safely use products.

- + Carefully follow instructions on the label provided.
- + Only use the recommended amount.
- + Do not mix products.
- + Only use products in rooms with proper ventilation. (New Hampshire DES, 2003)

Eight Options for Managing Household Hazardous Waste

After exploring the multitude of options that are being used to manage Household Hazardous Wastes across the country, eight options appear to be most feasible for communities of Sullivan County. There are variations on these throughout the country and what is being shown are the most prevalent




characteristics of each of the approaches. They can be used as 'stand alone' or in combination.

It is also noted that most comprehensive hazardous waste management programs have a funding source tied to other revenue generating waste management activities rather than property taxes. Typically these revenue sources include: tipping fees for waste delivered to a lined landfill facility or an incinerator; monthly collection charges to residents for municipal waste collection; pay-as-you-throw charges; vehicle registration surcharge for the town reclamation trust fund; or a surcharge on waste water (sewer) utility charges. Currently, the majority of waste collection and disposal activities, particularly in the larger communities in Sullivan County, are managed privately. This limits potential non-property tax revenue sources to support effective HHW management. However, future agreements with waste collection and/or disposal facilities can be negotiated with a dedicated surcharge fee for properly managing HHW. We strongly recommend that all local governments in Sullivan County consider, when negotiating future disposal agreements, to include a HHW management surcharge that is dedicated for this purpose.

Option #1: Alternatives and Proper In-Home Management

Ultimately this program should be a part of every management option. The first part of this program is to provide educational materials that describe alternative products, sometimes made from common household ingredients, which can substitute for commercially purchased products that become Household Hazardous Waste. An additional component of this program is in-home management, which is an educational program that will demonstrate proper storage and disposal for products that eventually could enter the waste stream as HHW.

The Advantages of Alternatives and Proper In-Home Management

-  This program is relatively inexpensive to operate.
-  When effectively delivered, it can reduce future HHW disposal costs.
-  The safer alternatives may be less expensive for the consumer.

- This can reduce the amount of hazardous and regular waste generated.
- The safer alternative products are healthier for consumers and hazardous products are avoided.
- By avoiding bringing hazardous products into the home chances of accidental child poisoning are reduced.
- When followed, the program is healthier for the environment in and around the home (lawn and garden).
- The mailings and information are fairly easy to distribute.

The Disadvantages of Alternatives and Proper In-Home Management

- Some of the information may not be understood.
- This program requires a behavior change by consumers who may be resistant.
- Homemade products may not work as well or in the same manner as more hazardous products.
- Because this is an in-home program it is hard to measure its success directly.
- The program is more labor intensive (to mix and use alternative products) for the consumer.
- Not everyone will read the information provided.

Example of a safer substitute for glass cleaner:

Glass Cleaner

1 quart warm water

1/4 cup white vinegar (or 2 tablespoons

lemon juice)

Mix ingredients and store in a spray bottle.

(Alameda County Waste Management Authority)

Numerous public informational brochures lists suggested alternatives to buying a commercially produced cleaner that can be made from ingredients that many people normally have around the house anyway. Most programs actively encourage residents not to generate HHW by encouraging the purchasing of safer household products. In this way the community saves on hazardous waste management and disposal costs and the residents uses safer products.

The second theme was to completely use up the item instead of trying to dispose of it. Here is an excerpt from one web site encouraging residents to do just that with latex paint:

“Use it all! You paid for it, so put a second or third coat on whatever you’re painting.”

(The Milwaukee Metropolitan Sewerage District)

Again, the recurring theme of reducing the overall hazardous waste stream through education and offering an alternative instead of throwing something out is promoted.

Option #2: Swap Shops

Swap shops, places to exchange unwanted household products, are an option that can be a part of a permanent Household Hazardous Waste facility, a transfer station, or facility that does NOT accept HHW. Products that can be considered HHW when they are disposed of, and are still in their original containers, can be left in an area for others to take and use. The key condition is that the products cannot be mixed and must be in their original containers with all of the product information intact. Swap shops are not currently subject to HHW regulation and have no special storage requirements. However, local fire, business, and building codes still apply. The products should be safely stored on shelving in the same manner as they were in the store in which they were originally purchased. Check with New Hampshire Department of Environmental Services for any other specific requirements.

The Advantages of Swap Shops

- Eventually the products get used up, and never have the opportunity to become a waste.
- There are inexpensive start up and operating costs for this alternative.
- Swap shops have few regulations and requirements.
- They meet consumer needs cost-free by making a product available.
- By being at an existing transfer station they are very convenient locally.
- There are no disposal costs.

The Disadvantages of Swap Shops

- A town must provide a proper storage location.
- A town may not wish to be involved with redistributing these types of products.
- Having a swap shop may require staff time for monitoring.
- It can be difficult managing products that remain on a shelf for a longtime.
- There is the potential for interaction between leaking containers.
- Products can come in with seals broken, thus you are not always certain of container contents.
- If facility runs year-round it will have to be heated.
- May require additional staff time.

Option #3: “Take Back”/Return to Vendor

The “Take Back” approach is when the hazardous product is taken back to a place that sells the original consumer product. Some, though not all, quick lube stations will take used car oil. Many of the larger box stores specializing in home improvement sales will take used batteries and compact florescent light bulbs. Some computer companies will accept some computer components. The theme here is that the town

incurs no expense with this program; the cost is entirely on the vendor from which the item was purchased. In other words, the item returned to the vendor has to then be managed by the vendor.

The Advantages of “Take Back”/Return to Vendor

- These companies have facilities capable of handling the hazardous waste they can accept.
- There is no or low cost to the consumer.
- An offer like this can increase consumer visits to businesses.
- There are no disposal costs to the community.

The Disadvantages of “Take Back”/Return to Vendor

- The consumer must drive with the hazardous product to the take back location.
- Not all products may be returnable.
- Some places may charge to return the products.
- There is no central location--different products must be returned to different vendors.
- Limited types of materials are returnable or can be managed in this way.
- Very few retail stores will accept unused products even if unopened.
- Vendors will not be interested if costs exceed their perceived benefits.

Below are a few local vendors who currently (2009) have take-back programs:

Home Depot

(425 Washington St., Claremont)

Take back rechargeable batteries and florescent bulbs (CFL and long)

Ace Hardware

(141 Charlestown Rd, Claremont)

Take back rechargeable batteries and florescent bulbs (CFL and long)

Aubuchon

(36 John Stark Highway, Newport)

Take back florescent lights (CFL and long bulbs)

Some Salvation Army (Goodwill) organizations work with Dell Computer to take-back old computers, regardless of the brand. Check to see if this is the current situation locally.

Note that these vendors may change. The web-link below provides a current list of all vendors.

http://des.nh.gov/organization/divisions/waste/swrtas/markets_materials.htm

Option #4: Multiple or Single Day Collection(s)



Residents Take Advantage of Hazardous Waste Collection Day (Bogart, 2007)

Multiple or single day collections programs vary significant across the country. Most collection events are normally established at the beginning of each year. The collection event's date, location, hours, collection rate, and what items are and are not being collected are posted to the public via the Internet, flyers, and newspapers. The location of these multiple or single day collections are normally held at transfer stations or municipal public works facilities, or other municipally owned locations such as paved parking lot areas that are not being used on that day. These periodic annual collections are typically planned and held jointly among several municipalities.

Independent hazardous materials management contractors are hired to manage all aspects of the collection. This includes staffing, the physical collection area, packing containers for the collected Household and Small Quantity Generator hazardous wastes, licensed transportation and disposal of collected materials, serving as the formal "generator" of the materials collected, and managing potential volunteers. Pre-registration is sometimes required of

participating businesses (Small Quantity Generators) so the contractor can plan for the proper number of containers and equipment. These events are usually scheduled on non-holiday weekends to maximize participation of residents.

The first annual collection of HHW in the region was organized in Grafton County by the Upper Valley Household Hazardous Waste Committee in 1984. For the last several years, the Upper Valley Lake Sunapee Regional Planning Commission has organized the collections and expanded the collections to Sullivan County. Historically, there is a cost sharing with partial grant funding from the State of New Hampshire. (New Hampshire DES, 2009)

The Advantages of Multiple or Single Day Collection(s)

- Since this is one of the most common Household and Small Quantity Generator Hazardous Waste management programs, there is a high availability to obtain long-term relationships with contractors. (Patrick Engineering, Inc., 2005)
- It is easy to arrange multiple or single day collections with other programs such as mobile or permanent programs.
- Liability is assumed by a private company, not the local governments sponsoring the collection event. (DF Ali, 1996)
- Since multiple or single day collections require educational outreach, it is very accepted within the community it is serving. (ANR VT Household Hazardous Waste, 2006)
- The more frequently multiple or single day collections are held, the more participation occurs, which increases public support for the continuation of collection events. (DF Ali, 1996)
- Multiple or single day collections are very elastic, meaning that frequency is based on the need within a municipality. (Patrick Engineering, Inc., 2005)
- Permits are uncomplicated; to obtain and prepare an area for collection is not difficult. (New York Rural Water Association, 2008)
- Educational outreach often captures the media's attention that can increase participation in future collections. (ANR VT Household Hazardous Waste, 2006)
- Collections can virtually be set up everywhere they are desired as long as permitted.
- The initial costs of the single or multiple day collection events are typically less expensive than a curbside collection or a permanent facility. (Criner, 2002)
- A storage facility is not needed which allows for a smaller budget.

- In New Hampshire the state currently covers part of the costs of the collection event.
- Single day collections are likely to increase the public demand for developing a permanent program. (Patrick Engineering, Inc., 2005)



The Disadvantages of Multiple or Single Day Collection(s)

- There is potentially an increased possibility of hazardous waste spills as well as injuries. (Criner, 2002) However, to date, there has never been a spill at a NH collection event.
- Multiple or single day collection events are irregular and participation rates depend directly on the weather, location, event date, distance, wait time, and advertisement level.
- Typically, there is a lower fixed cost and a higher disposal cost even though participation can be low compared to permanent facilities. (Marylandrecyclers, Demers, 2005)
- There is a very high cost to volume ratio, which means that the expenditure may exceed the budget if there is more (or less) participation than expected. (Patrick Engineering, Inc., 2005) However, you may be able to negotiate a lump-sum payment per collection day to the vendor if you have a long term agreement.
- A great deal of advertising is required in order to ensure sound participation rates.
- Traffic may increase within the area of collection, which could lead to car accidents and hazardous waste spills.
- Single day events are likely to increase the public demand for a permanent program. (Patrick Engineering, Inc., 2005)
- Communities often see multiple and single day collections as an inconvenient HHW disposal process. (EPA Manual for One Day Community Collection Events, 1993)
- Long-term storage issues are more likely to occur for residents. (Patrick Engineering, Inc., 2005)

- If a resident misses an event, they may be more likely to throw the HHW in the garbage, rather than storing it for another year.
- If these collections are irregular, a nearby contractor may be difficult to schedule.
- On-site education outreach is limited by the short timeframe during a collection.
- These single day events do not meet the significant HHW disposal needs that arise upon selling a home, and the typical requirement to remove and dispose of all chemicals from the home prior to sale.
- If a town chooses not to financially participate in a collection, homeowners from that town may not be allowed to participate in the collection.

Option #5: Fixed Site Multi-Day

This option could be considered a hybrid between a permanent facility and a multiple or single day collection. A simple description is that it has the components that a single-day event would have, such as an unloading area with spill control, a drop off area for solids, and signage that would be part of the set-up that a certified hauler would have to construct. The main difference is that the areas are left set-up. Household Hazardous Waste can be dropped off only when the hauler is present for the regularly scheduled event. There is no long-term storage for HHW at this type of facility and it is only open when the hauler is present.

Advantages of Fixed Site Multi-Day

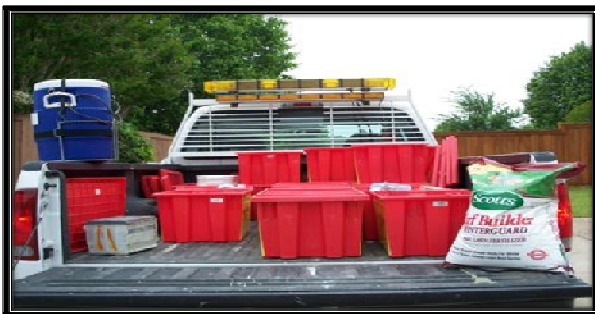
- Less expensive compared to permanent facilities and typically less expensive than a single day event (but the cost is highly dependent upon the vendor/hauler contract).
- Towns set dates annually which allows for planning by residents.
- There is less set up and break down costs than for single day events.
- This type of program works well with other programs such as a swap shop.

Disadvantages of Fixed Site Multi-Day

- This site may not be convenient for the region served.

- Although the events are scheduled in advance it has a limited frequency.
- There can be resistance to siting when it is near residential areas or other high value areas. However, if located at the current waste transfer station, this may be less of a concern.
- When a designated permanent area is constructed it has a limited use for the investment. However, the use of pre-existing buildings may help address this disadvantage.
- Construction is subject to zoning regulations and hazardous waste regulations.
- Any potential site control conditions have a cost (e. g. spill and fire control).
- The commercial hauler still has set-up costs, although they should be lower.

Option #6: Curbside Collection



Curbside HHW Collection Program (City of Allen, Texas)

Curbside Collection, also referred to as “At-Door Collection”, is when Household and Small Quantity Generator Hazardous Wastes are picked up by a hazardous waste program directly from a home or small business. These collections are normally arranged with individual households prior to collection or are scheduled by the community a few times a year. (Criner, 2002)

After calling the facility for pickup, households and small business owners are required to properly label and store their Household and Small Quantity Generator Hazardous Waste. Labeling procedures are determined by both the facility and the state where it is being collected. An example of such a container is shown above. The container is then placed near the garage or patio instead of the street corner to prevent hazardous spills, contamination with trash, vandalism, and to prevent contact with unaware civilians. (Criner, 2002)

Curbside collection is often run by the state or a metropolitan/local government facility. However, there are private contractors who also provide this service. These contractors often inform the local communities of these collections through education in schools and public advertisement.

The cost of this program is normally paid by the household or small business users rather than by the entire community or city. Contractors are normally able to inform each household or business of the cost before collection based on prior collection rates and the number of participants in the area. (Criner, 2002) Typically, these collections take place between five and ten times per year. (Patrick Engineering, Inc., 2005) Currently, this option has not yet been tried in New Hampshire.

The Advantages of Curbside Collection

- Residents do not need to transport their own hazardous products or waste.
- Initially, there is a lower capital investment compared to building a permanent facility.
- The budget is somewhat elastic; collection can be implemented as needed. (Patrick Engineering, Inc., 2005)
- This is the most convenient of all the collection procedures as long as it is operated continuously.
- Educational materials that are necessary for the collection to properly take place can be sent directly to the homes and small businesses being serviced.



The Disadvantages of Curbside Collection

- This is the most expensive program in terms of costs compared to the weight (kilograms/pounds) of materials collected. (Patrick Engineering, Inc., 2005)
- There is no area set up to store excess quantities of HHW.
- Spills or other accidents concerning hazardous waste materials are more likely to occur at the point of pick-up and these potential spills could cause significant contamination if they are near water bodies or storm drains.
- Only small shipments of HHW can be collected during a collection event.

- The program operator has the ownership and the high liability of hazardous waste that is often near a road; unless liability is transferred to the contractor. (Patrick Engineering, Inc., 2005)
- There is a question as to who assumes liability while the hazardous waste is unattended.
- Obtaining a contractor to carry out curbside collection may be more difficult since there are many potential liabilities and regulations.
- The community being served requires detailed instructions for collection and disposal for each limited collection event.
- Normally curbside collection is by appointment only. (Patrick Engineering, Inc., 2005)



Option #7: Mobile Transfer Unit Pick-up

These collection events are very similar to multiple and single day collections. However, it requires a specially built or modified vehicle that is designed to collect as well as transport Household and Small Quantity Generators Hazardous Waste to a disposal site. (Land-of-Sky Regional Council Household Hazardous Waste Advisory Committee, 1998) Mobile sites typically follow a route within the service area, staying in place for a specified period and then moving the whole operation to the next site. Similar to one-day events, mobile units can have a set up at local transfer stations. Wastes are then transported to a main facility for processing and disposal. (Topic Hub for Household Hazardous Waste, 2008)

The vehicle must follow the specialized rules and regulations put in place by both the federal and state governments. These vehicles are often created to suit the needs of a collection. They are also customized for the collection program based upon factors, such as, the distance they will travel, the terrain they will encounter, the amount of Household and Small Quantity Generators Hazardous Waste they will need to hold, and the size of each community or area served. (HHW, Chace Anderson, 2008)



Household Hazardous Waste Trailer constructed in 2007 (Solid Waste District of LaPorte County, 2008)

A large mobile vehicle such as a semi-truck, or even a trailer, arrives at the site and sets up an area very similar to a multiple or single day collection. However, since the mobile collection can easily transport collection materials and personnel, the events are typically more frequent and occur in more locations. (Land-of-Sky Regional Council Household Hazardous Waste Advisory Committee, 1998)

After the Household and Small Quantity Generator Hazardous Wastes are collected and safely stored on the mobile means of transport, they are given to a contractor's facility or a permanent facility. These facilities then process each hazardous waste item and store each item until it is disposed of or sent to another location to be discarded. (HHW, Chace Anderson, 2008)

Advantages of Mobile Transfer Unit Pick-up

- There is no need for a large initial investment for mobile collection facilities, especially if assigned to a contractor. (Land-of-Sky Regional Council Household Hazardous Waste Advisory Committee, 1998)
- Mobile collections sometimes have high participation rates, unlike other collection events such as multiple or single day collection events. (HHW, Chace Anderson, 2008)
- Mobile collection events can be brought to the community in need of the service. (Land-of-Sky Regional Council Household Hazardous Waste Advisory Committee, 1998)
- The public generally accepts mobile collection as a more convenient approach to Household and Small Quantity Generators Hazardous Waste collection. (ANR VT Household Hazardous Waste, 2006)

- Collections can virtually be set up anywhere to reach any community or outlying elderly, rural, or homebound individual.
- The number of collection events can be determined and easily implemented throughout the year if the budget changes.

Disadvantages of Mobile Transfer Unit Pick-up

- High disposal costs are associated with mobile collection due to the small quantities of hazardous waste delivered at one time to contractors.
- Staff is in need of a higher level of training.
- More time and effort is needed to complete these collections than a permanent collection.
- There is high cost to volume ratio of materials collected.
- There is a greater chance for hazardous waste spills and other accidents while transporting hazardous waste from distant locations.
- There is less control over the hazardous waste while stationed on the road or in temporary collection areas.
- Special fees and permits are associated with transporting hazardous waste.
- A lot of advertising is required to have a moderate participation rate.
- Additional permits are required to deliver to contractors, including additional staff.



Option #8: Permanent Facilities



A permanent facility is just what it sounds like. In prior research it has been found that a vast majority of the permanent facilities are sited with existing transfer stations and maintain similar hours for convenience. Very few facilities are stand-alone at a separate location. Perhaps the simplest goal to meet is in making the Household Hazardous Waste facility accessible to its users. In only one case was there found to be a facility that required reservations to be made for waste collection.

Characteristics of permanent facilities are that they are essentially a specialized transfer station or holding area for HHW. Structures must be built to standards that provide safe storage for materials and be accessible and safe for users. The structures must be able to contain spills, be well ventilated and have a degree of fireproofing. The wastes that will be coming to the facility can be solid or liquid, so there must be appropriate containers for their storage prior to their removal from the facility. Note that these facilities DO NOT treat HHW. These facilities are constructed to temporarily store the waste until a certified hauler can remove it.

The implementation of a permanent facility requires significant initial capital costs and the requirement for ongoing operational costs. However, the benefits of having a permanent facility may well outweigh the costs. The most significant factors in weighing benefits vs. costs of this approach includes site development and other capital costs and long term operating contractor (bid) costs.

Advantage of Permanent Facilities

- Towns will always have a place for the disposal of the waste.
- Encourages proper disposal of a hazardous waste and protection of the environment throughout the region.
- Potentially greater participation rate.
- Permanent facilities may have lower long term costs than multiple or single day events.
- Disposal costs can be shared among towns if a co-op is formed.

Disadvantages of Permanent Facilities

- There is a very large initial investment.
- Greater constant sources of funding are required to operate and maintain these facilities.
- Additional personnel and training costs may be required.

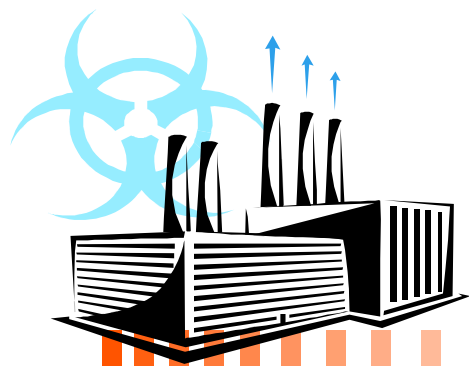
While in the process of looking at all of the permanent facilities that currently exist throughout the United States, each seems to have a common theme of being well used and beneficial to the communities in which they are located. Once the facility is constructed and residents are aware that it exists, the disposal of the HHW becomes a part of the normal routine of going to the transfer station. Many of the facilities that were researched reported that disposal of HHW rose markedly in the months immediately following the opening and then leveled off as residents became aware that they now had a permanent place to dispose of the waste that was previously only disposed of during annual special events.

When communities choose to construct a permanent collection facility to make collection more convenient, the design usually includes an unloading area, containment and storage areas, fire suppression equipment, safety equipment, emergency eyewash and shower, and supplies storage. More elaborate facilities have separate sorting areas, laboratories, carports, explosion-proof heaters, and swap rooms. Because materials do not have to be removed from






the site immediately, permanent facilities afford more opportunities for recycling, reuse, consolidating, and limited local treatment.

Requirements for Permanent Facilities

Prior to getting started with designing a permanent facility, the basic requirements must be reviewed. The first requirement is quite obvious, a year round structure in which to consolidate and temporarily store Household Hazardous and Small Quantity Generator Wastes. An engineering design firm will be needed to specify and design specific facility characteristics that will be driven by building codes and other requirements. These will likely include, but are not limited to: unloading areas, containment systems, consolidating and storage areas with proper ventilation, explosion proof lighting and heating systems, fire suppression equipment, safety equipment, emergency eyewash and related requirements. A facility must be able to meet all of the requirements of handling and temporarily storing hazardous wastes.



Basic Requirements of a Permanent Facility

-  Accessibility to residents
-  Safe storage
-  Meets all regulatory standards
-  Finances
-  The HHW can be removed efficiently

Safe Storage in a Permanent Facility

As noted above, hazardous wastes exhibit many properties that make them difficult to safely manage. Storing them safely while they are waiting for transportation to an off-site disposal facility is a critical component in designing an effective facility. The materials that are brought to the facility must be in containers that are considered safe for storage. What the facility must do is to duplicate those conditions that contained the hazardous nature of the material. Fireproof cabinets, sealed containers and many other products for the

containment of hazardous materials are available on the market from many vendors.

Regulatory Requirements of a Permanent Facility

For a facility to exist it must meet all of the regulatory requirements of both the state and federal governments. At this time, the NH state requirements are still a “work-in-progress.” Any community considering building a permanent facility should first talk with NH Department of Environmental Services. The federal requirements are available but are also subject to change over time. A facility, although permanent, is going to need to be flexible enough in nature to be able to evolve along with the regulations. A current critical point to keep in mind is the difference in the regulations for the different volumes of hazardous waste that are generated and stored by facilities. An entirely different set of standards exists between Small Quantity and Large Quantity Generators and forecasting the volumes of wastes that will be generated is a critical early component in the planning for both the capital and annual operating budget and the type of facility.

Operating a Permanent Facility and Minimizing Costs

The operation of a permanent facility requires specially trained individuals. One common approach is to subcontract to a licensed hazardous materials management and transportation organization (HW Vendor) for both the operation of the facility and the transportation of the consolidated hazardous materials. This can limit local liabilities and could be the most economically feasible approach. It is recommended that potential vendors, along with representatives of the DES, are involved early in the planning phase of a permanent facility in order to enhance the future efficiency of operations and subsequently minimize future operating costs. Every facility reviewed for this study hired an external hazardous material disposal company (HW Vendor) to remove the household and small quantity hazardous wastes that they collected, consolidated and stored. Some sites also used HHW Vendors to operate the facility.

Finally, the most economically viable management strategy for Household and Small Quantity Generator Wastes in a region served by a permanent facility is to reduce the quantity of materials that are purchased that will need to enter the disposal system. This approach, like all of the others, should have a proactive HHW reduction program. This takes us back to Option #1: Alternatives and Proper In-Home Management, which

should be part of this option as well as all of the other options that were reviewed in this study.

Disposal of household hazardous waste down sewers, storm drains, or in the garbage can pose environmental and safety concerns. Improperly stored chemicals can cause house fires and accidental poisonings. We need to do everything possible to protect and preserve the quality of our ground and surface waters.

(Source: Salt Lake Valley Health Department)

Cost Considerations

There are a number of engineering studies of costs for different approaches for managing HHW. A major study was completed for the State of Maine in 2002 by A. Files and G. Criner of the University of Maine, Orono. Another was done by Patrick Engineering, Inc. in 2004 for the Jackson County, Illinois, Health Department. We also collected some local data from two regional facilities in Keene, NH and Hartford, VT. This information was then analyzed to identify areas of agreement that could serve as a general guide for projecting costs for HHW management. Specific budgeting for new HHW management facilities and programs must be developed based upon the actual site conditions and the planned operating plan that can vary significantly. Each of the eight options is briefly reviewed below. This is then followed by a summary table of our findings.

Options #1: Alternatives and Proper In-Home Management: The budget amount required for this option is dependent on the specific outreach program(s) that will be delivered. The amount for this program can range from a few thousand dollars to the costs of a full time individual and related direct outreach costs. Since a reduction in the purchasing of hazardous household products can lead to a significant reduction in the quantity of HHW generated, it is recommended that 10% of the annual operating budget be dedicated to this pollution-prevention approach.

Capital cost: \$0. Annual operating cost (per town or region): \$1,000. - \$50,000.

Option #2: Swap Shops: Swap shops are a relatively inexpensive approach. The only costs include: an area that is protected from the weather, shelving, and some limited staff time to insure products that are redistributed are in their original containers and are currently available to retail customers. Typically, these swap shops are located at a local waste transfer facility and are overseen by existing staffing. Therefore, this option typically has nominal capital and annual costs.

Capital cost (per town): \$100. - \$1,000. Annual operating cost (per town): \$0. - \$500.

Option #3: “Take Back”/Return to Vendor: There is no direct costs for this approach except the nominal cost of dissemination of information as to where residents and businesses can “take back” certain hazardous products. Staff costs, if any, are usually considered part of Option #1.

Capital cost: \$0. Annual operating cost: \$0.

Option #4: Multiple or Single Day Collection(s): “Single-day collection events” is the only HHW program that has been provided in this region. There was one “single-day collection” last year that was located in Sullivan County (Town of Newport, July 12, 2008). There were, however, collections nearby in the town of Newbury and the city of Lebanon. The cost for this one day collection event in Newport was \$16,886. It served 278 households (695 individuals). Estimated cost per household was \$60.74. A state grant from DES reduced this cost to \$44.88 per household.

Capital cost: \$0. Annual operating cost per collection: \$16,886. (after state grant: \$12,478.)

Option #5 Fixed Site Multi-Day: This approach includes significant capital costs and a commitment to a higher level of collection events and the related annual operating costs. The capital and operating costs are based on four facilities/studies that seem appropriate and in scale for the Sullivan County region. Costs for these facilities dating from 1991 to 2002 are shown as historic costs and the costs are adjusted for inflation (2008 dollars).

Capital Costs:

- Keene, NH: This facility is a metal 1,200 s.f. facility that was constructed from a re-use part of an existing structure. It includes two external pre-fab hazardous waste storage units. It is not heated, has no plumbing, and is used seasonally. It currently serves 21 local governments in the Monadnock Region with a population of 77,108. The capital cost (1997) was \$150,000. (2008: \$210,215).
- Hartford, VT: This facility is a 576 s.f. cement block building with one pre-fab hazardous waste storage unit. It is designed to be used year-round with an explosion proof heating system. It has served a population from 17,500 (5 towns) to the larger Upper Valley region of approximately 80,000 individuals. The capital cost (1991) was \$100,000. (2008: \$158,215).
- Study for HHW facilities in Maine (Criner, 2002). This facility was designed to serve a population of 73,407. It is a metal building. The capital cost is \$225,000 (2008: \$269,275). The size was not given.
- Santa Cruz County, CA: This facility built in 1993 has served a population of 66,000 for 15 years. It contains 5,300 s.f. of space. It cost \$400,000 (2008: \$595,986).

Reviewing these facilities and others, it is recommended that a minimum capital budget of \$250,000 is needed for a HHW facility for Option #4. This assumes a new metal building of approximately 1,000 - 1,200 s.f. and one pre-fab hazardous waste storage unit. It does not include site development costs since they are highly dependent upon site considerations. It also assumes that this facility is used seasonally and therefore does not need weatherization or a heating system. If a year-round use facility is desired, these additional capital costs should to be included.

Operating Costs:

Annual operating costs for Option #4 are highly dependent upon the level of participation and the bids received from potential hazardous waste contractors. For example, in 2007 one HHW facility received four hazardous waste contractor bids for the same level of service for a three year contract. The four bids received gave for their annual costs of providing services of \$110,000, \$285,000, \$355,000, and \$720,000. With the highest bid being 554% higher than the lowest bid, it is very difficult to provide a tight estimate of the costs for managing HHW under Option #4. However, recognizing these limitations, the following provides our best estimate of annual operating costs for a fixed facility that provides 12 to 24 HHW collections per year.

- Maine's pro-forma annual operating budget assumes 5% overall annual participation rate in a service area population of 73,407. Pro-forma annual operating costs, including hazardous waste disposal, is \$201,311 (2008: \$253,573)
- The City of Keene's annual operating budget includes city staffing (one person) for the 24 collection events (8 am -1 pm), advertising, and the hazardous waste contractor that operates all un-loading, bulking, and disposal activities. Advertising cost is \$6,000 and site staffing cost for 24 part-days (192 hours) is approximately \$3,000. Nearly all of the cost is associated with the hazardous waste contractor. The current annual contractor cost (with a 2.9% participation rate) is \$110,000. This is equivalent to \$48.89/person served by the facility (assuming an average household contains 2.5 people). However, after reviewing other bids previously received and the state of this industry, this cost could either double (or triple) within two years. If this is the case, the cost per person served would increase to \$97.78 or more (annual operating costs of \$220,000 or more).

The interpolation of this information to the Sullivan County region with a population of 42,061 (54.5% of the region served by Keene) provides an annual operating cost of \$60,000/yr. (low estimate) to \$175,000/yr. (mid/high-level estimate). This assumes a 2.9% annual participation rate (1,220/year). If capital costs are amortized over 10 years, the annual capital and operating costs range from \$85,000 to \$200,000. This assumes that there are 12 to 24 collections per year, the facility is centrally located at an existing public works/waste management facility in Sullivan County, the facility does not require significant site development, and staffing is provided from a local government (at the marginal costs).

Capital cost (minimum): \$250,000. Annual operating cost: \$60,000. - \$175,000

Option #6: Curbside Collections: This approach has been documented as the most expensive program in terms of costs compared to the quantity of materials collected. It also has significant hidden liability costs in a region with high precipitation rates, many streams, and wetland. With hazardous materials placed outside for "curbside" pick up, clean-up costs for potential spills could quickly doom this approach. Therefore, no further cost analysis was conducted for this option.

Option #7 Mobile Transfer Unit Pick-Up: This option also does not exist in New Hampshire. After interviewing a knowledgeable source the reason appears to be that

the region is too rural. Previous efforts to explore this approach indicated that it was cost-prohibitive. Without significant concentrated population centers in Sullivan County, the transportation costs for this option could not be justified. Subsequently, no further analysis was conducted for this option.

Option #8 Permanent Facilities: Permanent facilities and Option #5: Fixed Site Multi-Day facilities are very similar. Most permanent facilities in rural areas function as fixed site multi-day facilities since they do not have trained hazardous waste personnel on staff and depend upon an external contractor to provide this level of expertise. The design of the physical structure for a permanent facility and that of a fixed site (for multi-day collections) could be equivalent. The Hartford, VT facility meets all of the standards for a permanent facility, but has always functioned as a fixed site multi-day facility. It contains explosion proof wiring, heating, lighting, and ventilation systems. It also has a secondary containment system, fire rated wells and doors, and other construction practices required for a hazardous environment.

Cost considerations of a "permanent facility" as compared to a "fixed site" could be considered the incremental costs on making the facility meet year-round operating standards, including HVAC, plumbing, insulation, and related costs. The annual operating cost for a permanent facility would be identical to that of the Option #5: Fixed Site Multi-Day program with the same operating plan. Therefore the costs for a permanent facility are the costs for a fixed site plus the additional capital costs for meeting year-round operating standards. It is estimated that for a 1,000 to 1,200 s.f. facility, this incremental cost is between \$100,000 and \$150,000.

Capital cost: \$350,000. -\$400,000. Annual operating cost: \$60,000 - \$175,000

Summary of Costs Estimates

Option	Capital Cost	Annual Operating Costs	Total Costs (Assuming 10 year amortization of capital costs)
#1 Alternatives and Proper In-Home Mgmt.	0	\$1,000 - \$50,000	\$1,000 - \$50,000
#2 Swap Shops	\$100 - \$1,000	0 - \$500	\$10 - \$600
#3 "Take Back"/Return to Vendor	0	0	0
#4 Multiple or Single Day Collections(s)	0	\$16,886/collection	\$16,886 per collection
#5 Fixed Site Multi-Day	\$250,000	\$60,000 - \$175,000	\$85,000 - \$200,000 (For 12- 24 collections)
#6 Curbside Collection	N/A	N/A	N/A
#7 Mobile Transfer Unit Pick-up	N/A	N/A	N/A
#8 Permanent Facilities	\$350,000 - \$400,000	\$60,000 - \$175,000	\$95,000 - \$215,000 (For 12- 24 collections)

Comparing Eight Potential Options

Household Hazardous Waste Management Options for Sullivan County Communities

Scale: 1 = Least Optimal 5 = Most Optimal

FACTORS	Option #1 Alternatives and Proper In- Home Management	Option #2 Swap Shops	Option #3 "Take Back"/Return to Vendor	Option #4 Multiple or Single Day Collections	Option #5 Fixed Site Multi- Day	Option #6 Curbside Collection	Option #7 Mobile Transfer Unit Pick-Up	Option #8 Permanent Facilities
Capital Costs	5	5	5	3	2	1	1	2
Operational Costs (Per Quantity Collected)	5	5	5	2	3	1	1	3
Convenience	5	4	2	2	4	5	4	5
Quantity Collected (or Reduced)	5	4	2	2	3	2	3	3
Local Liability & Security	5	4	5	5	5	2	3	5
Ease of Implementation	4	5	4	3	2	1	1	1
Opportunity for Public Education and Outreach	5	3	3	4	4	3	3	4
Sustainability	4	4	3	3	4	2	2	4
Flexibility re: New Regulations/Conditions	5	5	4	5	4	2	3	4
Staffing Requirements (Training, labor, etc)	4	4	5	4	3	1	1	2
Site Requirements	5	4	5	4	3	2	2	3
Ease of Funding	4	4	4	4	2	3	3	2

Average Rating of 12 Criteria	4.7	4.3	3.9	3.4	3.3	2.1	2.3	3.2
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Current Household Hazardous Waste Single Day Collections

Serving Sullivan County

Many Sullivan County residents participate in already established Household Hazardous Waste collections throughout the region.

The Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) coordinates four Household Hazardous Waste collections per year—two in Sullivan County and two in adjacent Lebanon, NH in Grafton County. The UVLSRPC region towns do not necessarily sign up for all four collections nor do they participate every year. If a household attends a collection that their town has not signed up for, the cost of disposal is personally incurred by the household. Sullivan County municipalities within the UVLSRPC's region which have participated in a collection subsequent to 2007 are: Cornish, Goshen, Lempster, Newport, Plainfield, Springfield, Sunapee, Unity, and Claremont. Over 400 households from these Sullivan County municipalities participated in UVLSRPC collections in 2007 and again in 2008.

In 2008, the Town of Sunapee coordinated separate collections with Springfield and neighboring Merrimack County towns. At two of these collections (one in Sunapee and one in New London), a total of 11 households from the Town of Springfield and 222 households from the Town of Sunapee participated. This was in addition to participation in the UVLSRPC collections that year.

Acworth currently participates in all HHW collections held at the Keene facility in southwestern New Hampshire. Approximately 11 households participated in 2008.

Washington holds one private HHW collection a year for residents of the town. Approximately 60 to 65 households participate in the collection.

Croydon, Grantham, Langdon, and Charlestown do not currently participate in or hold HHW collections for their towns. Residents are told to go to larger towns or cities on collection days to dispose of their HHW and must personally incur all costs. Langdon residents can bring their receipt to the Alstead town office to be reimbursed for disposal costs. (NOTE: Langdon pays to use Alstead's transfer station, hence reimbursement comes from Alstead) There was no data available how many residents from these towns participate in HHW collections.

It is estimated that at least 720 Sullivan County households participated in a HHW collection in 2008.

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Sources of Research Information Organized by Type of Management Strategy

Permanent	One day	Alternatives	Definitions	Funding/Budget	Curbside	Swap shop	Rules/law	Design	Mobile	Source Information	Date	Additional Notes on Source	Location	Web Address
x		x	x				x			Alameda County Waste Management Authority	2009	Alameda County Waste Management Authority	Retrieved from stopwaste.org	http://www.stopwaste.org/home/index.asp?page=293
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	x		x							City of Philadelphia, PA	2008	Streets Philadelphia	Retrieved from Household Hazardous Waste Drop-Off Events	http://www.phila.gov/streets/hazardous_waste.html
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x				x					Fairfax County, Virginia	2009	Hazardous Waste Management	Retrieved from Fairfax County, Virginia homepage	http://www.fairfaxcounty.gov/dpwes/trash/disphhw.htm
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				x	x		x		New Hampshire Department of Environmental Services	2008	New Hampshire Department of Environmental Services TrueValue and Ace Hardware stores that recycle fluorescent lamps	NH	
			x	x			x		New Hampshire Department of Environmental Services	2008	Fiscal Year 2008-2009 Tentative Schedule of Household Hazardous Waste Collections	Retrieved from NH Department of Environmental Services:	http://desnhgov/organization/commissioner/p2au/pps/
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