



VERMONT SOLID WASTE DIVERSION & DISPOSAL - 2001

Two Studies Completed By The Vermont Solid Waste Program Evaluated Municipal Solid Waste Composition & The 2001 State-Wide Municipal Solid Waste (MSW) Diversion Rate.

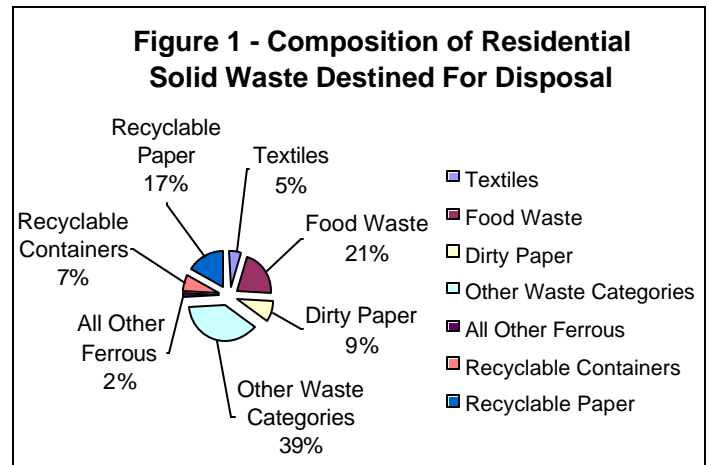
The Vermont Solid Waste Management Program recently completed two studies, which provide useful information for imcreasing waste reduction and diversion.

SOLID WASTE COMPOSITION

A solid waste composition study¹ provides valuable data on what materials remain in the waste stream that might be diverted. The study was an opportunity to compare the composition of municipal solid waste in urban/suburban areas versus more rural parts of the state, commercial versus residential sources and seasonal variations. Significant observations from the study include:

- ?? Approximately 24% of the residential waste stream destined for disposal consists of recyclable paper, bottles and cans (Figure 1). Similarly, in the commercial sectors this same potential exists to increase diversion of these materials.
- ?? Food wastes are the largest single material on a weight basis in the residential waste stream. Food waste is also prevalent in large quantities from some restaurants and grocery stores.
- ?? Plastics are a growing part of both residential and commercial waste streams,

replacing other packaging materials. Of particular significance is the relatively large volume of plastic film. Adjustments in collection programs and development of recycling markets will be necessary to respond to this shift in materials.



2001 MSW DIVERSION RATE = 31%

A 2001 municipal solid waste (MSW) diversion rate study² provides a "current" estimate of Vermont's state-wide municipal solid waste diversion rate. Data was collected from recycling facilities; organics composting operations; reuse facilities and programs, soft drink and beer distributors; scrap metal facilities and businesses; and manufacturing facilities and institutions that deliver materials directly to recycling markets (economic recycling).

¹ Vermont Waste Composition Study. June 2002. DSM Environmental Services.

² Vermont's Municipal Solid Waste Diversion Rate. September 2002. DSM Environmental Services.

The MSW diversion rate is calculated by estimating the percentage of total materials recycled, reused and composted.

The MSW diversion rate for 2001 was calculated using this formula:

$$\text{MSW Diversion Rate} = \frac{\text{Recycling + Reuse + Composting}}{\text{Recycling + Reuse + Composting + MSW Disposal}}$$

The results of the study indicate that for the year 2001 Vermonters diverted about 31 percent of our municipal solid waste from disposal, up from 19 percent in 1989 (Table 1). However, the diversion rate has declined when compared to 1998, 1999 and 2000 (Table 2).

Nonetheless, the Vermont Solid Waste Management Plan has a 50 percent diversion goal by 2005. The Agency estimates that in order to achieve this goal, the annual amount of municipal solid waste diverted through prevention, reuse, recycling and composting must increase from about 182,000 tons in 2001 to more than 300,000 tons in 2005 (Table 2).

SOLID WASTE DISPOSAL

Vermont's solid waste is disposed at landfills in Vermont, New Hampshire, & New York as well as waste to energy facilities in New Hampshire and New York.

In 2001 about 75% of Vermont's solid waste, including biosolids, was disposed in Vermont and about 25% was disposed in New Hampshire and New York (Tables 4 & 5). About five years of capacity is available at the 2 regional lined landfills located in Vermont, assuming disposal continues at their current actual fill rate. If these 2 landfills were to take all of Vermont's solid waste, the remaining years of capacity drops to 3.6 years (Table 6). An application to expand the Waste USA landfill is expected in 2003.

Vermont Solid Waste Diversion and Disposal Report For 2001 Includes The Following Tables:

Table 1 Solid Waste Diversion – 2001. Estimated By Material Type & Diversion Activity.

Table 2 Generation, Diversion and Disposal. Vermont Municipal Solid Waste. 1994 - 2001 (Actual) and 2002 - 2005 (Projections In Order To Reach 50% Diversion Rate).

Table 3 Vermont Construction & Demolition Waste - 2001. Construction & Demolition Waste Diverted From Disposal Through Acceptable Uses.

Table 4 Vermont Solid Waste - 2001. Disposal and Incineration.

Table 5 Destinations For Vermont Solid Waste - 2001 Disposal & Incineration

Table 6 Operating Solid Waste Disposal Capacity in Vermont. Status as of July 2002.

Table 7 2000 Estimated Quantities of Biosolids Managed In and Out of State.

Table 8 Summary of 2000 Vermont HHW/CEG Hazardous Waste Program Activity.

For more information:

Contact Julie Hackbarth with the Vermont Department of Environmental Conservation Solid Waste Program at (802) 241-3446

Both reports and other solid waste information can be obtained by visiting our website at:
www.anr.state.vt.us/dec/wastediv/solid/home.htm

TABLE 1

**SOLID WASTE DIVERSION - 2001
ESTIMATED BY MATERIAL TYPE & DIVERSION ACTIVITY**

MATERIAL	SOURCE OF MATERIAL						TOTAL	% of Total
	Recycling Facilities	Soft Drink and Beer Distributors(1) (Broker Direct)	Economic Recycling (Direct to Market)	Scrap Metal Facilities	Organics Composting	Reuse Facilities & Programs		
PAPER	51,730	386	33,495	0	41	137	85,788	47%
CONTAINERS	15,501	13,260	117	0	0	19	28,897	16%
SCRAP METAL	(2)	0	251	34,830	0	159	35,240	19%
ORGANIC WASTES	0	0	0	0	29,626	0	29,626	16%
MISCELLANEOUS	830	0	14	0	0	2,167	3,011	2%
Total:	68,061	13,646	33,877	34,830	29,667	2,482	182,562	100%
% OF Total:	37%	7%	19%	19%	16%	1%		

2001 MSW DISPOSED (tons): 415,249

2001 MSW DIVERSION RATE: 31%

(1) Total includes 3737 tons of deposit return containers processed by recycling facilities.

(2) Included in "Scrap Metal Facilities" totals.

TABLE 2
GENERATION , DIVERSION AND DISPOSAL
VERMONT MUNICIPAL SOLID WASTE
1994 - 2001 (ACTUAL)
2002-2005 (PROJECTIONS IN ORDER TO REACH 50% DIVERSION RATE)
UPDATED 12/19/02

MSW Generation, Diversion & Disposal - Actual & Projections (Tons) ^[3]									
	1994	1998	1999	2000	2001	2002	2003	2004	2005
Generation ^[1]	474,800	570,750	563,564	576,797	597,811	606,778	615,880	625,118	634,495
Diversion	164,830	195,930	199,301	189,401	182,562	216,233	249,905	283,576	317,247
Disposal	309,970	374,820	364,263	387,396	415,249	390,545	365,975	341,542	317,247
Population Estimate ^[2]	583,836	600,416	604,683	608,827	613,090	618,117	623,185	628,296	633,448
Per Capita MSW Generation (Tons/Year)	0.81	0.95	0.93	0.95	0.98	0.98	0.99	0.99	1.00
(Pounds/Day)	4.46	5.21	5.11	5.19	5.34	5.38	5.42	5.45	5.49
Per Capita MSW Diversion (Tons/Year)	0.28	0.33	0.33	0.31	0.30	0.35	0.40	0.45	0.50
(Pounds/Day)	1.55	1.79	1.81	1.70	1.63	1.92	2.20	2.47	2.74
Per Capita MSW Disposal (Tons/Year)	0.53	0.62	0.60	0.64	0.68	0.63	0.59	0.54	0.50
(Pounds/Day)	2.91	3.42	3.30	3.49	3.71	3.46	3.22	2.98	2.74
% of MSW Waste Generation ^[3]									
		1998	1999	2000	2001	2002	2003	2004	2005
Generation	100%	100%	100%	100%	100%	100%	100%	100%	100%
Diversion	34.7%	34.3%	35.4%	32.8%	30.5%	36%	41%	45%	50%
Disposal	65.3%	65.7%	64.6%	67.2%	69.5%	64%	59%	55%	50%

NOTES:

^[1] MSW generation as projected in "Characterization of Municipal Solid Waste in the United States: 1998 Update," Franklin Assoc. August 1999. Page 132, Table 39. MSW generation is projected to increase 1.5 percent per year between 2002 and 2005.

^[2] Vermont Population 1994, 1998, & 1999 - Table CO-EST2001-12-50 - Time Series of Vermont Intercensal Population Estimates by County: April 1, 1990 to April 1, 2000. Vermont Population 2000 & 2001 - US Census Bureau. Vermont Population Projections 2002 - 2005 - 0.82% increase per year. based on US Census Bureau data 1990 - 2000.

^[3] 1994 - 2001, actual. 2002-2005, projected to achieve goal of 50% diversion in the year 2005.

TABLE 3

VERMONT CONSTRUCTION & DEMOLITION WASTE - 2001

**CONSTRUCTION & DEMOLITION WASTE & WOOD DIVERTED FROM
DISPOSAL THROUGH ACCEPTABLE USES ^[1,2]**

MATERIALS	(TONS)
C&D Processing Facilities ^[3]	3,950
WOOD ^[4]	3,913
Ground C&D & Wood Used In Landfills	7,160
TOTAL TONS DIVERTED:	15,023

2001 C&D Disposal: 90,541 Tons

2001 C&D Acceptable Use Rate =

$$\text{(Reuse}^{[5]} + \text{Acceptable Use)} / \text{(Reuse}^{[5]} + \text{Acceptable Use} + \text{Disposal)}$$

2001 C&D Acceptable Use Rate = 14%

^[1] Data obtained from solid waste management facility quarterly reports submitted to the Vermont State Solid Waste Management Program for calendar year 2001.

^[2] This data represents estimated state totals for these materials handled by Vermont material recycling facilities and recycling, storage and transfer facilities before being transferred to a C&D processing facility for further treatment or directly for use.

^[3] ERCO-NH, Waste Management of Eastern NY & Southbridge-MA

^[4] Untreated wood chipped and used as mulch or burnt as clean fuel.

^[5] Currently data is not collected for C&D reuse operations.

TABLE 4**Vermont Solid Waste - 2001
Disposal & Incineration**

DESTINATION	TYPE OF WASTE					Waste Used in Landfill ^[2]
	MSW (Tons)	C&D/Wood (Tons)	Other ^[1] (Tons)	Total (Tons)	% Disposed	
In-State						
Landfill^[3]	293,373	78,093	10,822	382,288	74%	31,100
Incineration^[4]		3,429		3,429	1%	
Subtotal:	293,373	81,522	10,822	385,717	75%	
Out-of-State						
Landfill	66,774	8,166	544	75,484	15%	3,920
Incineration	55,102	853	284	56,239	11%	
Subtotal:	121,876	9,019	828	131,723	25%	
Total:	415,249	90,541	11,650	517,440	100%	35,020

NOTES:

[1] Includes biosolids(5798 tons), asbestos waste, bulky waste, dead animals, industrial waste, contaminated soils, medical waste and "other" waste. In previous years, biosolids disposed were not included in this table.

[2] Waste Used In Landfills - Petroleum contaminated soils (292 tons), foundry sand (3,513 tons), biosolids (5,456 tons), paper sludge (16,057 tons), and other wastes (2,230 tons) of which 4,928 tons used was from other states. Ground C&D (3186 tons) and crushed glass (366 tons) used as road base material at Vermont landfills and as alternative cover material (3920 tons) at an out of state landfill.

[3] Does not include 685 tons of C&D from other states disposed at the Burgess landfill.

[4] 3384 tons of clean wood waste was collected by the Chittenden Solid Waste District and chipped and burned for energy recovery at the McNeil generating plant. 45 tons of clean wood was reported to have been burned at transfer station sites.

TABLE 5 DESTINATIONS FOR VERMONT SOLID WASTE - 2001 DISPOSAL & INCINERATION

State	Facility	MSW (Tons)	C&D & Wood (Tons)	OTHER (Tons)(1)	Total (Tons)	Waste Used In Landfill(2)
VT	Waste USA Landfill	181,866	51,692	7,885	241,443	10,688
	WSI Landfill	109,426	20,866	2,935	133,227	18,414
	3 - 1000 Ton Landfills	2,081	134	2	2,217	1,998
	Burgess C&D Landfill ⁽³⁾		5,280		5,280	
	On-site Disposal, clean wood - Transfer Stations		121		121	
	On-site Burning, clean wood - Transfer Stations		45		45	
	McNeil - Burn clean wood		3,384		3,384	
	2001 - Total Vermont:	293,373	81,522	10,822	385,717	31,100
MA	Haverhill Waste To Energy	1,791			1,791	
	Pittsfield Waste To Energy	1,261			1,261	
	North Adams Transfer Station	1			1	
	2001 - Total Massachusetts:	3,053			3,053	
NH	Wheelabrator Waste To Energy, Claremont	22,375	199	67	22,641	
	Lebanon Landfill	15,055		271	15,326	3,920
	North Country Landfill, Bethlehem	3,388	1,259	259	4,906	
	Waste Management/Keene Transfer Station	2,945	122		3,067	
	Mt Carbury Landfill	929			929	
	2001 - Total New Hampshire:	44,692	1,580	597	46,869	3,920
NY	Adirondak Waste To Energy	29,675	654	217	30,546	
	Clinton County Landfill	21,590	6,785	14	28,389	
	Seneca Meadows Landfill	20,916			20,916	
	Albany Landfill	1,950			1,950	
	2001 - Total New York:	74,131	7,439	231	81,801	
	2001 - Total Out-Of-State	121,876	9,019	828	131,723	3,920
	2001 - Total In-State & Out-Of-State	415,249	90,541	11,650	517,440	35,020

(1) Includes biosolids(5798 tons), asbestos waste(1551 tons), bulky waste(576 tons), industrial waste(3100 tons), contaminated soils(15 tons), medical waste(128 tons) and "other" waste(482 tons). In previous years, biosolids disposed were not included in this table.

(2) Waste Used In Landfills - Petroleum contaminated soils (292 tons), foundry sand (3,513 tons), biosolids (5,456 tons), paper sludge (16,057 tons), and other wastes (2,230 tons) of which 4,928 tons used was from other states. Ground C&D (3186 tons) and crushed glass (366 tons) used as road base material at Vermont landfills and as alternative cover material (3920 tons) at an out of state landfill.

(3) Does not include 685 tons of C&D from other states.

TABLE 6

**Operating Solid Waste Disposal Capacity in Vermont ^[1,2]
Status as of July 2002**

Solid Waste Landfills ^[1,2]	Remaining Capacity For Waste(tons)	Maximum Permitted Fill Rate 2001		Actual Fill Rate For 2001 Permit Year (tons/year)	Remaining Years of Capacity ⁽⁴⁾
		(tons/day)	(tons/year)		
Waste USA, Coventry (Phase I, II, III)	1,392,000	1,500	240,000	239,039 tons (4/1/0-3/31/02)	5.8
WSI 3 ^[5] Moretown (Cell 2)	473,778	600	172,000	133,227 tons (1/1/01-12/31/01)	3.6
Totals	1,865,778	2,100	412,000	372,266	5.0

Vermont Solid Waste Requiring Disposal (2001): 517,440 Tons

Remaining Vermont Landfill Capacity If All Vermont Solid Waste Was Disposed In VT Landfills: 3.6 Years

[1] Does not include other capacity certified by ANR that has not been received Act 250 permits and haven't been developed (Northwest District & Greater Upper Valley District), capacity proposed for permitting by one privately owned landfill, or potential capacity involved in other legal proceedings (Chittenden Solid Waste District).

An application for expansion of the Waste USA Landfill is expected in 2003

[2] Does not include the three 1000 TPY unlined landfills operating in Bristol Town, Shaftsbury and Salisbury.

[3] Actual fill rate for permit years includes biosolids disposed.

[4] Based on actual fill rate for waste disposed.

Note: In addition to waste disposed, landfills received wastes that were used in the landfill as alternative cover or road base material: Waste USA landfill - 10,688 tons, WSI Landfill - 18,414 tons.

[5] WSI = Waste Systems International, Inc.

TABLE 7**2001 Estimated Quantities of Biosolids Managed In and Out of State
(As reported to RMS¹ from Vermont facility generators)**

Management Option	In-State (wet tons)	Out-of-State (wet tons)	Total (wet tons)	Percent of Total	Percent Managed
Beneficial Uses:					
Land Application	8,227	827	9,054	17%	
Composted	4,087	31,180	35,267	65%	
Subtotal	12,314	32,007	44,321		82%
Non-Beneficial Uses:					
Landfill	6,713	687	7,400	13%	
Incineration	0	2,660	2,660	5%	
Subtotal	6,713	3,347	10,060		18%
Total:	19,027	35,354	54,381		100%
Percent of Total In & Out of State	35%	65%			

¹RMS - Residuals Management Section. Wastewater Management Division. (802) 241-3822

TABLE 8

SUMMARY OF 2001 VERMONT HHW/CEG HAZARDOUS WASTE PROGRAM ACTIVITY

TOWN/DISTRICT	COLLECTION EVENTS	HH UNITS	PARTICIPANTS	BUSINESSES	REPEAT PARTICIPANTS	% REPEAT PARTICIPANTS	% TOTAL PROGRAM PARTICIPATION	PROGRAM COST	\$/PART	POUNDS OF WASTE	POUNDS OF WASTE PER PARTICIPANT	POUNDS OF MERCURY-ADDED PRODUCTS/DEBRIS	POUNDS OF ELEMENTAL MERCURY	LINEAR FEET OF FLUORESCENT LAMPS
Addison County SWMD	20	11025	1009	11	545	54.01	9.15	\$67,785.86	\$66.46	62960	62	240	106	31823
Bennington RPC	2	7670	203	4	86	42.36	2.65	\$14,369.96	\$69.42	30304	149	1	20.6	0
Central Vermont SWMD	9	24373	360	29	117	32.50	1.48	\$34,059.00	\$87.56	16,673	46	105	0	11037
Chittenden SWMD ¹	254	55077	8868	348	0	0.00	16.10	\$153,172.00	\$16.62	462825	52	1231	0	154540
Greater UVSWMD ²	6	12470	517	2	200	38.68	4.15	\$40,493.00	\$78.02	46136	89	20	8	5796
SWAC/JMSC (Rutland)	4	5979	229	0	0	0.00	3.83	\$10,999.45	\$48.03	7065.63	31	0	6.75	1120
Lamoille RSWMD	6	9772	402	7	170	42.29	4.11	\$18,930.41	\$46.28	19632	49	6.75	0	1424
Londonderry Group ³	2	3256	121	6	10	8.26	3.72	\$10,069.18	\$79.28	11840	98	0	0	2215
Mad River SWA	4	4927	401	31	259	64.59	8.14	\$18,980.90	\$43.94	18126	45	5	8	3364
NE Kingdom SWMD	90	8212	582	9	0	0.00	7.09	\$14,211.84	\$24.05	25760	44	3	5	12405
Northwest SWMD ⁴	9	9855	396	2	0	0.00	4.02	\$12,776.88	\$32.10	27200	69	0	0	2031
Rutland County SWMD	177	20068	1078	40	0	0.00	5.37	\$29,997.68	\$26.83	40520	38	0	0	12062
S. Wind/Windham SWMD	3	16534	245	6	0	0.00	1.48	\$22,592.00	\$90.01	18000	73	2	5	2667
White River Alliance	2	3496	92	2	0	0.00	2.63	\$3,756.27	\$39.96	3201	35	6	0	2820
Windham SWMD	2	13316	349	17	0	0.00	2.62	\$25,940.00	\$70.87	34800	100	0	0	40
Waste USA (NEK) ⁵	2	8032	212	0	0	0.00	2.64	\$15,056.41	\$71.02	14120	67	0	0	416
Burke/Sutton	2	797	65	6	65	100.00	8.16	\$4,243.90	\$59.77	6000	92	0	0	1200
Bristol	2	1502	66	0	66	100.00	4.39	\$7,709.15	\$116.81	5624	85	0	2	574
Derby	1	1902	68	0	45	66.18	3.58	\$5,148.65	\$75.72	6598	97	5	0	28
Georgia	2	1378	151	0	0	0.00	10.96	\$6,659.00	\$44.10	7600	50	0	0	1096
Highgate/Franklin	2	1554	40	0	20	50.00	2.57	\$2,150.00	\$53.75	1600	40	0	0	0
Randolph, Braintree & Brookfield	2	1798	232	1	0	0.00	12.90	\$16,683.85	\$71.60	17397	75	9	0	360
Swanton	2	2236	90	0	20	22.22	4.03	\$3,531.65	\$39.24	5600	62	0	0	0
St. Johnsbury	1	3618	191	21	85	44.50	5.28	\$15,778.00	\$74.42	19968	105	1	0	1200
Town of St. Albans	2	5570	376	0	0	0.00	6.75	\$9,500.00	\$25.27	9200	24	40	0	0
TOTALS	608	234417	16343	542	1688	26.62	5.51	\$564,595.04	\$58.05	918749.63	67	1674.75	161.35	248218

¹ Includes Underhill

² Includes Upper Valley Lake Sunapee, Corinth, Fairlee, Hartford and some NH participants

³ Includes the town of Winhall

⁴ Includes the towns of North Hero and Grand Isle

⁵ Includes the following towns: Albany, Barton, Brownington, Charleston, Coventry, Glover, Greensboro, Irasburg, Jay, Lowell, Newport Town, Newport City, Sutton, Troy, and Westfield.

SUMMARY

The following 2001 HHW/CEG Hazardous Waste Collection Data was tabulated from Solid Waste Districts, Alliances and Municipalities representing 96% of Vermont Households. These statewide collections cost approximately \$565,000, served approximately 16,300 participants and collected approximately 459 tons of Hazardous waste, 161 pounds of mercury, 1675 pounds of mercury-added products/debris and 248,000 linear feet of fluorescent lamps. In comparison, 2000 saw 96% of Vermont Households represented, cost approximately \$597,000, served approximately 15,600 participants and collected approximately 485 tons of Hazardous Waste, 25 pounds of mercury, 972 pounds of mercury-added products/debris and 141,000 linear feet of fluorescent lamps. From the two collection years, 2000 and 2001, several conclusions can be drawn and are as follows:

1. Average statewide cost per participant in 2001 was approximately \$58.05. This is a noticeable decrease from 2000 when the average cost per participant was \$76.47. In 2001, the total cost for statewide collections was \$32,000 less than 2000 (\$565,000 vs \$597,000). 2001 also saw a decrease in hazardous waste collected (459 tons vs 485 tons). As has been noted in past surveys, the larger fixed year-round hazardous waste facilities tend to have the lowest cost per participant (\$17-\$27) verses seasonal or single day collection events (\$32-\$116).
2. 2001 Statewide participation, when compared to 2000, saw an increase in both the total number of participants (16,300 vs 15,600) and the average statewide participation (5.51% vs 4.71%). Participants for 2001 included 542 businesses and 1688 repeat participants (repeat participants accounted for an average of 27% of the total 2001 participants). Fixed facilities, seasonal collections and some single-day collection events had higher than the state average participation rates (6.75%- 16.10%). There are several possible reasons for this higher participation rates that include; well established, advertised and received programs; increased awareness to household hazardous waste and increased availability of household hazardous waste collection events.
3. 2001 saw a slight increase in waste collected per participant when compared with 2000 (67 pounds vs 62 pounds). Larger established programs (which have longer collection seasons) tend to have a lower waste generation per participant than single day collection events. Increased education and collection opportunities may be some of the reasons for increased hazardous waste collection.
4. 2001 saw a noticeable increase in the number of collection events available statewide when compared to 2000 (608 vs 445), while the number of households that had access to collection events in 2001 increased slightly (234,417 vs 234,050).
5. Approximately 161 pounds of elemental mercury, 1674 pounds of mercury-added products/debris and 248,000 linear feet of fluorescent lamps was collected in 2001. This is a dramatic increase from 2000 when approximately 25 pounds of mercury, 972 pounds of mercury-added products/debris and 141,000 linear feet of fluorescent lamps was collected. This can be explained by the increased mercury education and awareness programs implemented by many solid waste districts, municipalities and alliances, as well as the state sponsored mercury education and awareness campaign.

Household estimates were derived from the Vermont Department of Health publication: *Population & Housing Estimates Vermont 1999*.

Conversion factors used were 8 pounds per gallon, 400 pounds per 55-gallon drum, gaylord or pallet and .15 pounds per lineal foot of fluorescent lamps.

This information is a collection of Household Hazardous and Conditionally Exempt Generator Waste surveys completed by various Solid Waste Districts, Alliances and Municipalities throughout the State Of Vermont. Every attempt has been made to provide accurate information on Vermont's Household Hazardous Waste and Conditionally Exempt Generator waste collections. Multi-entity collections and districts that provide collection services for other districts or municipalities have reported their collection numbers only (to help prevent any double counting). Any questions, suggestions or corrections, please feel free to contact , Thomas A. Benoit, Sr at (802) 241-3472 or e-mail at Tombe@dec.anr.state.vt.us.