
JOINT SOLID WASTE AND RECYCLING ANALYSIS

Joint Steering Committee:
Norway-Paris Solid Waste,
Inc. and Oxford County
Regional Recycling, Inc.

FINAL REPORT (June 2011)

DSM Environmental Services, Inc.
PO Box 2 (82 Main Street)
Windsor, Vermont 05089-0002



Table of Contents

Introduction.....	1
Definitions	1
Current Solid Waste Management and Recycling System	2
Oxford County Regional Recycling, Inc.	2
Norway Paris Solid Waste, Inc. (NPSW)	7
NPSW Transfer Station.....	7
Frost Hill Facility.....	8
Costs and Material Volumes	9
Other Town Transfer Stations.....	11
Gilead Transfer Station	12
Tri-Town Transfer Station, Bethel.....	12
Greenwood & Woodstock (G&W) Transfer Station.....	13
West Paris Transfer Station	14
Comparison of Transfer Stations Costs.....	15
Alternatives	17
Single Stream Recycling	17
Benefits	17
Disadvantages	20
Costs.....	20
Alternative Management Practices	25
OCRR Recycling Collection Efficiency	25
OCRR Processing Efficiency	25
OCRR Universal Wastes, Electronic Waste, and Household Hazardous Waste.....	26
Management of MSW, Bulky Waste and CDD at the Transfer Stations	27
Privatization.....	30
NPSW Transfer Station.....	32
Frost Hill Facility.....	33
Cooperative Contracting Arrangements	33
Recommendations and Conclusions.....	34

Introduction

DSM Environmental Services, Inc. (DSM) was contracted by the Joint Steering Committee of Norway-Paris Solid Waste, Inc. (NPSW) and Oxford County Regional Recycling, Inc. (OCRR) through a competitive proposal process to conduct an analysis of solid waste and recycling operations overseen by the two organizations. The analysis was to focus on two major issues facing NPSW and OCRR member communities. These are:

- What would the costs and benefits be to OCRR (and the member municipalities) associated with changing the current source separated recycling system with processing at the OCRR facility in Norway to single stream collection of recycling with transportation to single stream processing facilities outside of the region; and,
- What are the costs and contractual arrangements for transportation and disposal of municipal solid waste and are there any opportunities to reduce these costs through a joint contract or cooperative arrangements among a broader range of municipalities, and what are the potential costs and benefits of privatizing the Norway Paris transfer station?

In addition, DSM agreed to review arrangements for bulky waste and CDD management and disposal to determine whether there are opportunities to reduce costs through cooperative agreements, or in the case of CDD, in using the NPSW Frost Hill facility.

Finally, DSM agreed to review data on the costs of managing universal waste and electronics waste.

Definitions

Certain terms are abbreviated throughout this report. These are:

- MSW** Municipal Solid Waste which includes residential and commercial waste.
- CDD** Construction Demolition Debris
- HDPE** High Density Polyethylene (#2) Plastics
- OCC** Old Corrugated Cardboard
- ONP** Old newspaper
- UW** Universal Waste

Current Solid Waste Management and Recycling System

The population in the region receives solid waste management services directly from municipalities, who operate their own, or share responsibility for operation of small transfer stations; or from private haulers who provide curbside or containerized refuse collection service. Residential curbside recycling collection is not available in the region although a few haulers offer cardboard recycling to large generators. The Town of Bethel offers businesses cardboard collection through a contract with Pine Tree Waste.

The Towns have worked cooperatively through OCRR to provide recycling drop-off services at the municipal transfer stations in the region. OCRR collects recyclables from the drop-offs, and processes these materials at the OCRR facility which is located adjacent to the Norway/Paris transfer facility in Norway. The Towns of Norway and Paris have joined together as Norway Paris Solid Waste Inc. to operate both a solid waste transfer station and a separate construction and demolition debris (CDD) disposal facility referred to as the Frost Hill facility. These two organizations as well as the individual town services are described in more detail below, along with the costs associated with operating these facilities.

Oxford County Regional Recycling, Inc.

Oxford County Regional Recycling, Inc. (OCRR) provides recycling collection, processing and marketing services to its' eighteen member communities.¹ These communities represent a total population of roughly 26,000 and range from minor civil divisions and small towns such as Lincoln Plantation and Upton (with populations of less than 100) to larger towns such as Norway and Paris (with populations greater than 4500). However OCRR's service population is decreasing. The Town of Waterford recently left OCRR and switched over to single stream recycling at their transfer station, and the Town of West Paris plans to leave OCRR and switch to single stream recycling (but data from West Paris is included in this analysis).

These eighteen communities own and operate a total of thirteen solid waste and recycling transfer stations/drop-offs (including West Paris). OCRR collects from twelve of these facilities as the NPSW transfer station is located adjacent to the OCRR processing facility allowing Norway and Paris residents to deliver recyclables directly to the processing facility. OCRR also collects from area high schools, Sunday River Resort and Stephen's Memorial Hospital.

OCRR collects nine different material streams from the twelve facilities using a 24' flatbed truck and customized containers designed to fit on the truck. OCRR has adopted a routine collection schedule for each transfer station where nearly full or full containers used are replaced with empty ones, and loaded onto the truck for delivery to OCRR's processing facility in Norway. Containers are properly sized for each material type so that fill rates are similar and the collection truck typically swaps out six of the nine containers with each collection.

¹ The eighteen communities are: Bethel, Brownfield, Canton, Denmark, Gilead, Greenwood, Hanover, Hebron, Lincoln Plantation, Livermore, Milton Township, Newry, Norway, Otisfield, Paris, Upton, West Paris, and Woodstock.

The containers are provided to the Towns by OCRR and are well labeled with signs instructing users what should be placed in the box. OCRR uses three different size metal boxes for recycling collection: 4’x4’x8’ (4.7 cubic yards), 8’x4’x8’ (9.5 cubic yards) and 12’x4’x8’ (14 cubic yards). All three sizes are used at all of the locations that OCRR serves.

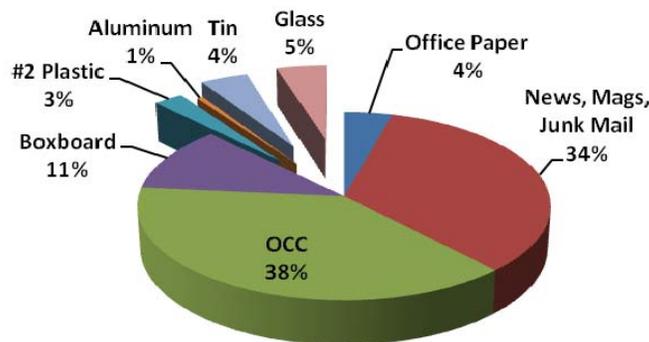
Quantities collected from each transfer station and from the Sunday River Resort, Stephens Memorial Hospital and area high schools are shown below in Table 1.

Table 1
Recyclable Materials Collected by OCRR in CY 2010

Transfer Stations	Office Paper (tons)	News, Mags, Junk Mail (tons)	OCC (tons)	Boxboard (tons)	#2 Plastic (tons)	Aluminum (tons)	Tin (tons)	Glass (tons)	Total (tons)	(%)	Universal Waste
Brownfield	0.0	19.2	15.7	4.1	1.6	0.5	2.0	5.1	48	3%	7.1
Canton	0.4	14.1	9.9	4.5	1.7	0.0	2.6	2.7	36	2%	2.6
Denmark	1.5	19.8	7.7	4.1	1.8	0.3	2.7	5.0	43	3%	3.1
Gilead	0.0	3.4	1.4	0.8	0.2	0.0	0.3	2.3	8	1%	1.4
G&W	1.2	44.4	25.2	10.9	3.2	0.6	4.8	7.6	98	6%	9.7
Hebron	0.0	25.3	11.2	6.1	1.8	0.0	2.4	3.7	50	3%	5.3
Lin.Plt	0.0	4.6	2.5	0.8	0.5	0.2	0.6	2.3	11	1%	0.4
Livermore	0.1	47.1	21.4	20.4	4.0	0.4	5.8	7.7	107	6%	4.0
Norway Paris	62.0	249.1	350.8	104.7	20.5	6.8	37.1	20.3	851	52%	29.8
Otisfield	0.0	29.9	14.0	7.2	2.3	0.0	3.2	5.6	62	4%	3.1
Tri-Town	2.4	65.6	91.4	11.8	3.7	0.2	5.7	7.9	189	11%	10.6
Upton	0.0	1.1	0.6	0.1	0.1	0.0	0.1	1.2	3	0%	0.4
West Paris	0.0	28.5	43.3	8.7	2.3	0.1	4.1	5.4	92	6%	4.1
Sunday River	1.0	5.6	34.3	0.7	0.0	0.0	0.0	0.0	41	3%	0.0
School Collections	0.7	1.5	6.6	0.6	0.4	0.4	0.5	0.4	11	1%	0.4
Totals:	69	559	636	185	44	9	72	77	1,652	100%	81.5
Percentage, by material:	4%	34%	38%	11%	3%	1%	4%	5%	100%		

As shown in Table 1, over half of the material (851 tons or recyclables plus 29.8 tons of universal waste) comes from Norway and Paris and is delivered directly to the OCRR facility. Material composition is high in fiber (at 83%), as shown in Figure 1 below. The facility only collects #2 HDPE plastics because Maine’s bottle bill covers all types of beverages which may be over 80 percent of PET bottles.

Figure 1
Composition of OCRR Recyclable Materials (CY 2010, by weight)



Some of the material delivered to the transfer stations is from businesses. DSM surveyed many of the transfer station operators to attempt to obtain a breakdown of the amount of recyclable material delivered by businesses vs. households. In addition, OCRR collects from five schools, one hospital and Sunday River Resort. These data were used to break out commercial recycling from residential recycling, as shown in Table 2, and to benchmark residential recycling by estimating the pounds recycled per household served by the transfer stations. Note that all material collected from the schools, the hospital and Sunday River is included in the column for commercial recycling.

Table 2
Estimate of Residential vs. Commercial Recycling (CY 2010)

	Total	Commercial	Residential	Residential
Material	<i>(tons)</i>	<i>(tons)</i>	<i>(tons)</i>	<i>(lbs/hh)</i>
Office Paper	69	55	14	2
Boxboard	185	1.2	184	33
OCC	636	318	318	56
News/Mag/ Junk Mail	559	7.1	552	97
Mixed Glass	77	0.4	77	14
Aluminum	9	0.4	9	2
Tin Cans	72	0.5	71	13
HDPE Plastics	44	0.4	44	8
Total:	1,652	383	1,269	222
<i>Percentage, by sector:</i>		23%	77%	

Each material stream is inspected before baling, and contaminants are manually removed by OCRR staff. Material is then fed, using a bobcat, into the hopper for baling. Bales are stored on site and shipped when sufficient quantities are accumulated. OCRR contracts with a broker to market the material.

The cost to operate OCRR in fiscal year 2010 is shown in Table 3. The total budget (including operating and capital costs) is shown by line item and then allocated by major activity performed by OCRR. These activities are: collection, processing and handling universal waste.

For collection, the major costs associated with collecting recyclables from the locations listed in Table 1 (except for Norway Paris where users deliver directly to the processing facility) include labor (a single driver/laborer), operation and maintenance of the flatbed truck, and replacement or maintenance of the recycling containers used at the transfer stations. The recycling containers used were custom made and in most cases, repair work is more economical than full replacement. In addition, capital replacement costs are included for the collection truck (e.g. mobile reserves).

For Universal Wastes, the labor costs to separate and repackage electronics and other universal wastes for recycling are estimated as well as any fees charged to OCRR for recycling certain materials. The variety of universal wastes handled by OCRR and the packaging and labeling requirements for shipping require careful attention by OCRR staff, and result in relatively high handling costs at the processing facility. OCRR sends the universal waste and electronic waste to a national recycler, *Universal Recycling Technologies* (URT), who picks up material free of charge because OCRR collects a large enough quantity. OCRR calls URT when enough material has been collected to fill a tractor trailer. URT has a

collection and transfer station in Newport Maine, where materials are later transported to their processing center in Portsmouth NH.

Finally, all remaining costs are allocated to processing. These include labor and equipment costs to handle each material, remove contaminants, load and operate the baler, and market baled materials. Also included are all other costs associated with administering the OCRR operation, although DSM attempted to allocate some of these costs to collection.

Table 3
OCRR Costs and Cost Allocation by Major Activity (2010)

	Expenditures	2010 FY	Collection from		Handling
			Transfer Stations (1)	Processing	Universal Waste
6000	Salaries and Wages	\$117,100	\$23,072	\$82,435	\$11,593
6010	Employee Benefits	\$33,000	\$6,502	\$23,231	\$3,267
6011	Uniforms	\$2,100	\$268	\$1,832	
6100	Mileage and Personal Expenses	\$1,000	\$128	\$873	
6105	Mobile Equipment Maintenance	\$12,000	\$9,000	\$3,000	
6116	Fixed Equipment Maintenance	\$1,000		\$1,000	
6119	Recycle Bin Maintenance	\$8,000	\$8,000		
6130	Data Processing Fee	\$2,000		\$2,000	
6131	Licenses and Fees	\$100		\$100	
6135	Payroll Tax Expense	\$10,000	\$1,970	\$7,040	\$990
6165	Plant Consumables	\$7,000		\$7,000	
6170	Recycle Promotion	\$5,500		\$5,500	
6180	Universal Waste Expense	\$3,500			\$3,500
6220	Utilities	\$10,000		\$10,000	
6221	Fuel	\$20,000	\$10,000	\$10,000	
6240	Insurance - General	\$16,000	\$1,771	\$13,608	\$621
6250	Leasehold Improvement	\$1,500		\$1,500	
6270	Accounting Fees	\$3,600	\$900	\$2,700	
6271	Audit Expense	\$3,300	\$825	\$2,475	
6291	OC/NP Shared Costs	\$1,000		\$1,000	
6300	Office Expense	\$1,500	\$375	\$1,125	
6324	Scale Maintenance	\$600	\$150	\$450	
6385	Fixed Reserves	\$10,000		\$10,000	
6390	Mobile Reserves	\$13,000	\$6,500	\$6,500	
Total Expenditures		\$282,800	\$69,461	\$193,369	\$19,970
	Tons Managed:	1,733	852	1,652	81
	Cost Per Ton:	\$163	\$81	\$117	\$245

(1) Collection from all transfer stations except for Norway-Paris where residents deliver all recyclables (including universal wastes) directly to the OCRR facility.

Total Expenditures in Table 3 are divided by the tons handled to determine: the cost per ton to collect, the cost per ton to process, and the cost per ton to handle universal wastes. Note that universal wastes management costs include both an average estimated cost of \$81 per ton to collect the material plus the handling cost incurred (estimated at \$245 per ton) for repackaging materials for shipping from the

OCRR facility. These costs on a per ton basis can be compared against alternative methods of management.

Revenues from the sale of materials cover the majority, but not all of the costs of operating OCRR. The balance - after material sales and other revenue to OCRR (e.g. interest income, rental of containers to facilities other than member Towns, and any cash reserve reduction) - must be met through Town assessments.

While material revenues are a key factor in determining annual assessments, they vary year by year depending on domestic and global demand for these materials, and any change in quantities collected. Revenue history for the last six years is shown in Figure 2 below and averaged \$178,000 (rounded) annually. Revenues for 2010 were not finalized but estimated by OCRR as of December 2010.

Figure 2
Revenues from OCRR Materials Sales (2005 – 2010)



Based on material sales estimates in 2010 and other revenues, the net costs to operate the OCRR are calculated and shown in Table 4. These costs are different from the budgeted net costs due to more recent data on material revenues made available for this report. For 2010, the estimated revenues from roughly 1650 tons of material sold totaled \$182,347, or averaged about \$110 per ton (rounded).

Table 4 shows the total OCRR expenditures minus the total revenues in the first column of figures. The second column shows the costs incurred by NPSW only (which excludes collection costs) minus estimated revenues for NPSW material only (using the average revenues collected per ton multiplied by the total tons delivered from Norway and Paris). The third column shows this same calculation for all other towns combined, and includes collection costs from the transfer stations to the OCRR processing facility.

The final column presents costs and revenues associated with handling universal waste. Note that the handling costs for universal wastes must be added back to each entity (e.g. NPSW and All Other Towns) to compute total costs for each transfer station. (The cost to collect universal wastes is included in the costs to All Other Towns in Table 4.)

The Universal Waste collection program at OCRR is partially funded through two sources of revenue: OCRR charges businesses for the disposal of the Universal and Electronic Waste, OCRR charges the towns for the disposal of light bulbs (lamps) containing mercury. OCRR estimated \$7,700 in Universal Waste (UW) as shown in Table 4.

These net costs are the basis for comparison of OCRR's current operation to single stream recycling at ecomaine.

Table 4
OCRR Revenues and Net Costs (FY 2010)

	Total	NPSW Only	All Other Towns	Universal Waste
Expenditures	\$282,800	\$99,642	\$163,188	\$19,970
Revenues				
Recyclable Sales (1)	\$182,347	\$93,962	\$88,385	
Universal Waste	\$7,700			\$7,700
Other Revenues	\$4,300			
Interest Income	\$4,000			
Total Revenues:	\$198,347	\$93,962	\$88,385	\$7,700
Net Cost:	\$84,453	\$5,679	\$74,803	\$12,270
Tons Managed:	1,733	851	801	81
Net Cost Per Ton:	\$49	\$7	\$93	\$151
(1) Estimated for 2010 based on sales to date, and allocated based on tons delivered.				

The net cost for universal waste of \$151 per ton may be higher if OCRR did not exist to manage the material collectively.

Norway Paris Solid Waste, Inc. (NPSW)

NPSW is a quasi municipal corporation formed in accordance with state law and an interlocal agreement between the towns of Norway and Paris. NPSW serves the towns of Norway and Paris for solid waste management and operates the Brown Street transfer station and the Frost Hill Construction and Demolition Debris (CDD) facility.

NPSW Transfer Station

The NPSW transfer station is located on a six acre parcel owned by the Town of Norway and adjacent to the former Norway solid waste landfill, which closed after completion of the transfer station in the mid 1980's. The transfer station serves a population of about 9,700 residents and is open five days a week (including Sundays). The facility accepts municipal solid waste (MSW), appliances and scrap metal, motor oil, fluorescent bulbs, ballast, and mercury thermometers and thermostats. Disposal is free but recycling is mandatory and residents are required to use clear bags, which are available for sale at the transfer station.

Several commercial haulers use the transfer station bringing in residential waste and some small amounts of commercial waste. They are also required to ask their customers to use clear bags. User fees are not charged for MSW unless haulers choose not to recycle. In these cases, a \$129 per ton tip fee is applied. According to NPSW facility operators, one hauler pays the tip fee.

DSM did not monitor transfer station use but was told that compliance with the clear bag policy is high. Because the Oxford County Recycling facility is located next door, it is relatively convenient for transfer station users to also recycle.

Fees are charged for other materials including tires, appliances and bulky items. Bulky waste delivered is charged 7 dollars per item. The workers tear apart the bulky waste and separate the materials, in part because of the disposal requirements at MMWAC. For example, cloth and cushions are disposed of with the MSW, metal goes into the metal container at the Transfer Station and the wood goes into the clean demolition pile at the Frost Hill facility.

MSW is either tipped (from a truck) or tossed into a hopper that feeds a stationary compactor loading into a 75 yard roll-off container (owned by NPSW). AlMighty Waste is under contract to haul full containers to the Mid-Maine Waste Action Corporation (MMWAC) waste to energy facility in Auburn for disposal. MMWAC is owned by twelve municipalities in the region and has a capacity of 200 tons per day.

NPSW has a 5 year contract with MMWAC to tip MSW at the facility for a set fee. The contract expires on March 31, 2013. The tip fee began at \$74.26 per ton and has an annual CPI increase. MMWAC has limitations on the size of materials accepted at the facility. Therefore bulky waste and construction and demolition debris (CDD) are kept separate from other MSW at the NPSW facility. Appliances and scrap metal are also separated for recycling at the NPSW transfer station.

Frost Hill Facility

The Frost Hill construction/demolition debris (CDD) facility was licensed in 1992 for the operation of a 4.5 acre landfill for construction and demolition debris and a 0.85 acre landfill for the disposal of inert fill. Materials accepted at Frost Hill include sheetrock, vinyl and other plastics, pressure treated wood, asphalt shingles and inert materials such as brick, concrete, and old toilets. In addition, land clearing debris, tree waste and leaf and yard are also accepted at the facility.

There is a scale at the NPSW transfer station on Brown Avenue but not at the Frost Hill CDD site, although a scale is budgeted for purchase in the coming year. Construction debris must be delivered to Frost Hill and contractors and residents are charged for disposal of these materials. Frost Hill charges \$120 a ton for shingles and sheetrock (or 6 cents per pound) and 1.5 cents per pound for demolition waste. Small trucks are charged based on the estimated volume (based on the size of the vehicle) and large trucks are charged based on the scale weight.

Materials are presently separated into four different streams: asphalt shingles; clean wood; inert materials and all other CDD and sheetrock. Management of these materials is as follows:

- Asphalt shingles are hauled by AlMighty Waste to Commercial Paving and Recycling Company (CPRC Group) in Scarborough Maine. AlMighty charges \$185 per haul to Scarborough and CPRC

Group also charges a processing/tip fee of \$48 a ton. CPRC Group uses the ground asphalt as part of a mix with concrete and brick as a sub-base material for roads. They also sell the ground material to paving companies and use it in their own hot mix at their on-site paving company.

- Clean demolition wood, wood from bulky waste and brush was chipped on-site last year by a contractor (i.e. Marshalls). Marshalls chipped 340.4 tons of wood and about ¼ of that was brush. Leaf and yard waste quantities are small and are composted on-site with manual turning.
- Inert materials including soil, porcelain, brick, concrete, etc. are crushed and used in the landfill construction.
- All other CDD including sheetrock, vinyl and other plastics, and pressure treated wood are hauled by Almighty Waste to Mid Maine Waste Action Corp (MMWAC) in Auburn. The hauling fee cost is \$185 from Almighty Waste and the tipping fee at MMWAC for CDD is \$85 per ton.

Costs and Material Volumes

The quantities of materials managed at the Transfer Station and at Frost Hill are shown below in Table 5. Note that inert materials were not weighed except for concrete but counted by item (138 items reported) so the total weight landfilled was estimated for 2010. Also shown below are the quantities recycled at the OCRR facility located next door to the transfer station. All numbers are rounded.

Table 5
Quantities of Material Delivered to NPSW Transfer Station and Frost Hill

	2010	
Materials Accepted By Facility	(tons)	Disposition/Notes
Transfer Station		
MSW	2,684	Transferred to MMWAC for disposal
Bulky Waste/CDD	76	Transferred to MMWAC for disposal
Total Disposed:	2,760	
White Goods	243	CFC Removal and Recycling
Car Batteries	NA	Recycling
Tires	75	Energy
Materials Reused	209	
Recycling/Reuse:	527	
Frost Hill		
Leaf/Yard Compost	2	Composted on-site
Wood CDD	340	Ground on-site and sold for energy
Asphalt Shingles	123	CRPC Group for Recycling
Inert Materials	20	Used on-site (17.36 tons concrete plus 138 porcelain items)
Recycling/Reuse:	485	
Total Material Handled:	3,773	
OCRR		
Recyclables	851	See Table 1 for breakdown
Universal Waste	30	Recycling
Recycling:	881	
Recycling Rate	41%	

Costs associated with operating the NPSW Transfer Station and the Frost Hill site are shown below in Table 6. For the 2012 budget year, operating hours at Frost Hill were cut from 37 to 24 hours per week to save on labor costs.

Total costs are shown in the first column of figures, and costs directly allocated to Frost Hill and then to NPSW are shown in the next two columns. Below each column the tons managed at each facility are shown and then divided by allocated facility costs to estimate the cost per ton to manage and dispose (or recycle) materials delivered to the respective facility.

Roughly \$115,000 in user fees are expected for FY 2012 based on revenue history. These revenues were estimated by DSM to be from Frost Hill or from the transfer stations based on the breakdown of user fees reported the prior year. Finally applying these revenues against facility costs presents the estimated net costs to operate each facility, and how much more revenues would need to be raised in user fees if the Towns did not appropriate the difference each year.

Table 6
NPSW Expenses and Revenues (FY 2012)

Expenses	FY 2012	Allocation of Costs	
	Budget (\$)	Frost Hill (\$)	TS (\$)
Wages	\$157,444	\$39,361	\$118,083
Employee Benefits	\$59,000	\$5,900	\$53,100
Liability and Property Insurance	\$10,000	\$2,500	\$7,500
Tipping Fees and Trucking	\$250,000	\$0	\$250,000
Building and Industrial Debris Disposal	\$64,000	\$64,000	\$0
Pit Closure and Monitoring	\$34,000	\$34,000	\$0
Maintenance and Repairs	\$15,000	\$2,250	\$12,750
Utilities and Fuel	\$11,000	\$1,100	\$9,900
Purchased Services	\$19,000	\$0	\$19,000
Supplies and Miscellaneous	\$6,500	\$650	\$5,850
Plant & Equipment	\$40,000	\$40,000	
Total Expense	\$665,944	\$189,761	\$476,183
Tons Managed:	3,564	485	3,078
Cost Per Ton:	\$187	\$391	\$155
Revenue			
Town of Norway Support	\$275,000		
Town of Paris Support	\$275,000		
Usage Fees (2)	\$115,000	\$73,471	\$41,529
Other Revenue	\$1,000		\$1,000
Total Revenue	\$666,000	\$73,471	\$42,529
Net	\$56	\$116,290	\$433,654
Net Cost Per Ton:		\$240	\$141

As shown in Table 6, Frost Hill’s operating costs are relatively high on a per ton basis. This results mainly from high fees charged by contractors to manage and dispose of CDD materials, the capital cost of installing a scale (one time cost), and the pit closure and monitoring costs which together represent 73 percent of the costs at Frost Hill for the coming year. Excluding these costs, it still costs over \$100 per ton delivered to handle the material at Frost Hill based on the quantities shown in Table 5. This information is important so that user fees can be set to match actual costs of operations and management by material type as discussed in the conclusions section.

In contrast, the low cost to manage appliances at the transfer station brings down the cost per ton of material delivered.

Other Town Transfer Stations

In addition to the NPSW Transfer Station there are 12 other facilities that serve the solid waste management needs of the other 16 member communities of OCRR. DSM attempted to collect volume and cost data from all 12 facilities as well as visited four facilities: Gilead, Tri-Town (Bethel), Greenwood & Woodstock (G&W), and West Paris. At the transfer stations, DSM observed equipment and facility layout and met with town officials and/or transfer station workers (except at Gilead which was closed during the site visit).

The types of materials collected at each transfer station, and the estimated volumes collected last year are shown below in Table 7. Please note that these totals differ from numbers reported by the State Planning Office and were collected directly from OCRR and/or each Town.

Table 7
Oxford County Transfer Station Material Volumes (Tons, 2010)

	Brownfield	Canton	Denmark	Gilead	G&W	Hebron	Lincoln Plt	Livermore	NPSW	Otisfield	Tri-Town (1)	Upton	West Paris	Totals
<i>Population</i>	1,468	1,134	1,121	179	2,147	1,071	45	2,204	9,724	1,692	4,582	61	1,749	27,177
Materials	(tons)													
MSW	545	318	524	57	563	420	27	302	2,684	558	2,631	64	598	9,291
Bulky/CDD	337		270	50	456			41	76	29	711			1,971
Total Disposed:	882	318	794	107	1,019	420	27	342	2,760	587	3,343	64	598	11,262
Recycling (OCRR) (See Table 1)	48	36	43	8	98	50	11	107	851	62	189	3	92	1,600
Universal Waste (OCRR)	7	3	3	1	10	5	0	4	30	3	11	0	4	81
Scrap Metal (2)	36	collects	67	5	collects			38	collects	86	collects	0	0	232
White Goods (2)	collects		92	collects	collects		4	collects	243		collects	13	16	369
Car Batteries	2		2				0		NA	1				5
Clearing Debris			6		6									12
Leaf/Yard Compost			32		3				2	71				108
Wood CDD	66		68		5				340	125			17	621
Asphalt Shingles (2)	7				collects				123	46	73			249
Tires	2				collects		0		75	5	19	11	6	117
Materials Reused	8		16				1		209	213	20	1		467
Total Recycled / Diverted:	175	39	329	15	121	56	17	149	1,874	612	311	29	136	3,861
Recycling / Diversion Rate	17%	11%	29%	12%	11%	12%	39%	30%	40%	51%	9%	31%	19%	26%

(1) Population adjusted for Tri-Town to account for Sunday River seasonal population. MSW tonnage includes commercial waste collected directly from businesses (and part of Town budget).

(2) Complete data on materials diverted from disposal was not available for all towns but "collects" is listed to indicate that the facility does accept the material.

Gilead Transfer Station

The Town of Gilead’s transfer station (as shown in the two photos at right) is open two days a week, Tuesday and Saturday, and serves an estimated population of 179 residents. A compactor and closed 50 cubic yard roll off container is used to collect MSW. A ramp between the compactor and two open top dumpsters (one for bulky/demolition material and one for scrap metal) enables easy access.

The transfer station has ample room to maneuver the 24’ flatbed truck according to OCRR’s driver. Recycling containers are lined up in a row off to one side away from the compactor and demolition dumpsters. Gilead also collects appliances as well as scrap metal.



Tri-Town Transfer Station, Bethel

Tri-town is the second largest transfer station in the region and serves the residents and small businesses of Bethel, Hanover and Newry. The transfer station is staffed by two workers and open three days a week, seven hours per day: Wednesday, Saturday and Sunday. DSM met with the Bethel Town Manager James Doar and station attendant Dave Hart at the facility to review operations.

Because the transfer station does not have three phase power, waste cannot be compacted onsite. Instead Pine Tree Waste collects MSW from fifteen, 10 cubic yard dumpsters (pictured at right) located at the site using a front loading packer.

Two, 40 cubic yard containers are used to collect demolition/bulky debris. When one is full they switch to the second container. Pine Tree hauled 86 containers of demolition/bulky waste (totaling 711 tons) to the Norridgewock landfill for disposal. A separate 40 cubic yard container is used for scrap metal collection and 13 loads of scrap metal were hauled by Pine Tree last year for recycling.

Other materials collected separately include asphalt shingles, clean wood, tires and reusable items. Shingles are hauled to CPRC Group in Scarborough for recycling at a tip fee of \$48 a ton, exclusive of hauling costs. Last year 3 loads (73 tons) of shingles were shipped. Clean wood is separated and given away for use as kindling. However the transfer station doesn’t take brush, yard waste or stumps.

Residents can dispose of appliances for a \$5 fee. In the past, residents had to empty freon first (available through Brooks Brothers at a cost of about \$20) before delivering appliances to the transfer station. Currently Big Green Recycling can remove freon as part of their collection and recycling service to the facility and so freon containing appliances are accepted at the facility.



Tires are collected by BDS Waste Disposal from Corinna, Maine. Last year BDS transported and disposed of three loads of tires from Tri-town transfer station.

Costs to operate the facility are summarized in Table 8. Last year expenses were roughly \$166,700 (rounded) net of revenues associated with the transfer station (this does not include the collection and disposal fees for commercial businesses). Currently Pine Tree charges the Town a flat fee of \$92 per ton for collection and disposal at MMWAC.

Opportunities to reduce costs may lie in separating more material from MSW or CDD bulky waste. Based on the information provided to DSM, operating costs at the facility are very low given the throughput. Total operating costs, excluding contracted services used for tip and transfer, as shown in Table 8, are roughly \$47,000 to manage roughly 1,500 tons of material plus an additional \$10,000 in expenses for contractors to remove, process or recycle materials other than MSW (excluding the OCRR assessment). These put operating costs at around \$35 per ton handled, excluding recyclables, and about \$30 including recyclables.

Table 8
Estimated Annual Costs to Operate Tri-Town Transfer Station

Expenses	(\$)
Labor	\$33,500
Other O&M Costs	\$13,396
Tip and Transfer	
MSW	\$55,200
Bulky/CDD	\$64,065
Metals, Tires, Universal Waste	\$9,515
Cardboard	\$1,000
Total:	\$176,676
Revenues (Metals, Other)	-\$10,000
Net Operating Costs	\$166,676

Greenwood & Woodstock (G&W) Transfer Station

DSM met with the station attendants, Dale and Paul, at the G&W transfer station. MSW is collected using an on-site compactor and a closed 50 cubic yard roll off (pictured at right), along with three additional 10 cubic yard dumpsters as back up for busy days. Pine Tree pulls the compactor once per week. In the past two months, they filled 2 MSW dumpsters.



G&W transfer station doesn't allow residents to dispose of brush or stumps. There is a stump dump located in town. In the summertime the transfer station operates a swap shop.

Like Tri-Town, G&W’s transfer station now accepts freon bearing appliances at no charge but used to require residents to pay for freon removal before they brought the appliance to the transfer station. G&W’s current contractor who collects the appliances also removes the freon.



Costs to operate the G&W facility are summarized below in Table 9. Operating costs, net of the tip and transportation charges, were roughly \$65,000 last year. In addition to 1,019 tons of MSW and CDD/Bulky waste accepted, the facility accepted scrap metal, appliances, wood waste, shingles and tires (as well as recyclables and universal wastes handled by OCRR). Managing these 1,200 tons of material (estimated) through the transfer station equates to a cost of about \$54 per ton.

Table 9
Summary of Costs to Operate the Greenwood Woodstock Transfer Station
(Annual Costs 2010)

	Current Costs (\$)	Estimated Tons (tons)	Cost Per Ton (\$)
Payroll	\$52,103		
Operational	\$9,881		
Maintenance	\$3,398		
Subtotal:	\$65,382	1,200	\$54
Tip and transportation	\$107,962	1,019	\$106
Total:	\$173,344	1,200	\$144

West Paris Transfer Station

DSM met with John White, Town Manager at the Town Offices and with attendants David and Kevin at the transfer station. Two employees work at the transfer station during operating hours.

Mr. White explained that the Town of West Paris was switching to zero-sort or single stream collection; a service that will be provided by Pine Tree. DSM followed up with Dan Johnson of Pine Tree by telephone, and later with Karen McNaughton. Dan said that Pine Tree plans to compact single stream material and then transport it to Scarborough and then on the Casella Recycling Materials Recovery Facility (MRF) located in Charlestown, MA.

Residents can take up to 8 cubic yards of demolition or wood per year; half of the cost is free and half the cost is charged to the resident at \$25 for every two tons. West Paris Metal takes the appliances (with the freon) for free. Tires are collected by BDS Waste Disposal from Corinna, Maine. The transfer station charges the residents \$2 for each tire. The transfer station does not take brush or stumps.



Comparison of Transfer Stations Costs

Each town was asked to send DSM a copy of their most recent annual budget for the transfer station and cost breakdowns for transportation and tip fees associated with MSW and with bulky waste and CDD disposal. DSM attempted to follow up with all towns to determine: how transportation was performed (under contract or through the Town); if under contract, the name of the contractor; and, the disposal location.

Using the information that was provided to DSM, the total costs to operate each transfer station exclusive of the transportation and disposal costs for MSW and CDD/Bulky Wastes was calculated and then divided by the tons delivered to each transfer station. These costs are shown in Table 10 along with the cost per ton handled to compare the operating costs.

Table 10
Transfer Station Operating Costs, Exclusive of Transportation and Disposal Costs

Transfer Station	O&M Costs (\$)	Contracted Services (\$)	Total Costs (1) (\$)	Tons Handled (2) (tons)	Cost Per Ton (3) (\$)
Canton	\$27,544	\$3,104	\$30,649	360	\$85
G&W	\$65,382	\$685	\$66,067	1,200	\$55
Hebron	\$34,943	\$538	\$35,480	476	\$75
Livermore	\$36,464	\$3,197	\$39,662	500	\$79
Norway-Paris SW	\$207,183	\$19,000	\$226,183	3,574	\$63
Otisfield	\$25,691	\$616	\$26,307	987	\$27
Tri-Town	\$46,896	\$10,515	\$57,411	1,538	\$37
West Paris	\$30,577	\$850	\$31,427	733	\$43
(1) Excludes MSW and Bulky/CDD Transportation and Disposal Costs.					
(2) Includes MSW, Bulky/CDD, Appliances, Tires, Scrap Metal and OCRR Recyclables.					
(3) Includes contracted services cost for all materials, except MSW and Bulky/CDD.					

Tables 11 and 12 (on the next page) list the haulers used and disposal locations for each transfer station for MSW and Bulky Waste/CDD respectively and the costs per haul, per ton, and total cost per ton for transportation and disposal, if the information was made available to DSM. In some cases, only a haul cost was obtained, and the Town was not able to verify the average tons per haul and therefore a cost per ton to haul could not be calculated.

In all cases the tip and transportation costs are the largest cost item for the transfer station with tip and transportation costs making up over 70 percent of some transfer station budgets.

In summary the transport arrangements vary by Town with Denmark’s MSW hauled in tandem loads by Pine Tree allowing for more tons per haul. Two transfer stations – Canton and Hebron - use their own equipment and employees to transport their MSW. Canton transports to the Jay Transfer Station and Hebron transports directly to Mid Maine Waste Action Corp. Livermore uses Archie’s Inc to haul their MSW to the Jay Transfer Station, where it gets transferred and hauled up to Norridgewock. Jay in turn allows Livermore residents to tip Bulky/CDD Wastes at Jay’s transfer Station.

Table 11

Hauling and Disposal Arrangements for MSW, By Town (2010)

Town	Brownfield	Canton	Denmark	G&W	Hebron	Livermore	NPSW	Otisfield	Tri-Town	West Paris
Population	1,468	1,134	1,121	2,147	1,071	2,204	9,724	1,692	4,582	1,749
MSW (tons)	545	318	524	563	420	302	2,684	558	2,631	598
Hauler	North Conway Incinerator	Town	Pine Tree	Pine Tree	Town	Archies	Almighty Waste	Pine Tree	Pine Tree	Pine Tree
Disposal Location	Mt Carberry Landfill in Berlin NH	Jay TS to Norridgewock	Maine Energy Recovery Company	MMWAC	MMWAC	Jay TS to Norridgewock	MMWAC	MMWAC	MMWAC	MMWAC
Cost to Haul (\$)	\$230	\$145	\$319	n/a	\$150	\$195	\$175	\$206	n/a	n/a
Average Tons/Haul (tons)	9	5	17	11	4	13	17	9	10	11
Cost per Ton to Haul (\$)	\$25	\$27	\$19	n/a	\$39	\$16	\$10	\$22	n/a	n/a
Tip Fee or Cost/Ton (\$)	\$56	\$93	\$64	\$101	\$79	\$95	\$80	\$90	n/a	n/a
Total Cost/Ton (\$)	\$81	\$120	\$82	\$101	\$118	\$111	\$90	\$112	\$92	\$97

Table 12

Hauling and Disposal Arrangements for Bulky Wastes/CDD, By Town (2010)

Town	Brownfield	Canton	Denmark	G&W	Hebron	Livermore	Frost Hill	Otisfield	Tri-Town	West Paris
Population	1,468	1,134	1,121	2,147	1,071	2,204	9,724	1,692	4,582	1,749
Bulky/CDD (tons)	337	unsure	270	456	420	unsure	164	unsure	711	unsure
Hauler	North Conway Incinerator	n/a Town of Jay TS used	Pine Tree	Pine Tree	Waste Management	n/a Town of Jay TS used	Almighty Waste	n/a	Pine Tree	Pine Tree
Disposal Location	Mt Carberry Landfill in Berlin NH	Norridgewock	Murphy's Waste Systems		Norridgewock	Norridgewock	MMWAC	Casco/Naples TS, Casco	Norridgewock	Norridgewock
Cost to Haul (\$)	\$230	residents haul	\$220	\$215	\$206	residents haul	\$185	residents haul	\$185	\$194
Average Tons/Haul (tons)	8.64	n/a	4.36	6.71	n/a	n/a	11.71	n/a	8.27	n/a
Cost per Ton to Haul (\$)	\$27		\$50	\$32			\$16		\$22	
Tip Fee or Cost/Ton (\$)	\$56	residents pay	\$88	\$66	\$90	118.25 + Res. Pay	\$85	0.05 / lb.	\$61	\$69
Total Cost/Ton (\$)	\$83	n/a	\$138	\$98	n/a	18.25 + Res. Pay	\$101	n/a	\$83	n/a

Alternatives

Based on discussions with the OCRR and NPSW, DSM's observations, and DSM's review and analysis of the data available, DSM evaluated the following alternatives for the region:

- Options for single stream recycling collection and processing, including how single stream collection and processing would be arranged, and the drawbacks and advantages of switching to single stream;
- Alternative management practices to obtain efficiencies and potential reduction of cost for municipal solid waste management;
- Recommendations for changes in CDD management;
- Future regional solid waste disposal alternatives available to the member municipalities;
- Can Town's manage Universal Wastes on their own and without OCRR; and,
- Any recommendations for improving organics recovery.

Single Stream Recycling

DSM evaluated the costs and benefits to OCRR and its member towns to switch from the current recycling system to single stream recycling collection. There are two options for the Oxford County region for single stream materials processing - the ecomaine facility, located in Portland and the Casella Recycling facility, located in Charlestown, Massachusetts (just north of Boston).

The benefits of changing to single stream recycling are presented below and followed by the costs related to these benefits as well as a discussion of the drawbacks.

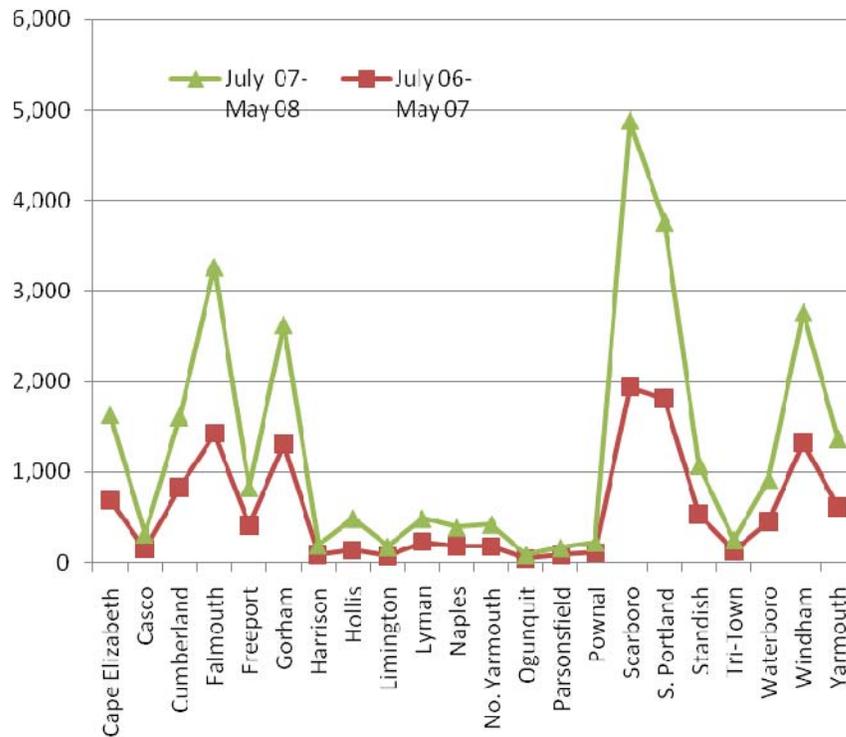
Benefits

The major benefits of switching to single stream are:

Increase in the number of materials accepted - The number of materials that could be collected for recycling would increase, and include the following new materials at ecomaine: plastic bags, aseptic/drink boxes, #1-7 plastic bottles, #1-7 plastic containers (except for Styrofoam). Casella Recycling accepts all of these materials except for plastic bags as well as all rigid plastics including containers up to 5 gallons, crates, laundry baskets, toys, landscape trays and pots, and child size pools

Increase in recycling – The convenience of storing mixed recyclables at home and emptying all recyclables into one container at a collection point typically results in an increase in participation in recycling and in capture of materials by participating households. However the amount of this increase is hard to predict. Data from 23 communities sending recyclables to Ecomaine shows an average increase in recycling of 21 percent, with a range from a low of – 5 percent (Portland) to a high of 160 percent (Hollis). These data are shown in Figure 3.

Figure 3
Tons Recycled Before Single Stream (July 2007 – May 2008) and after Single Stream (June 2008 – May 2009) at Communities Using ecomaine



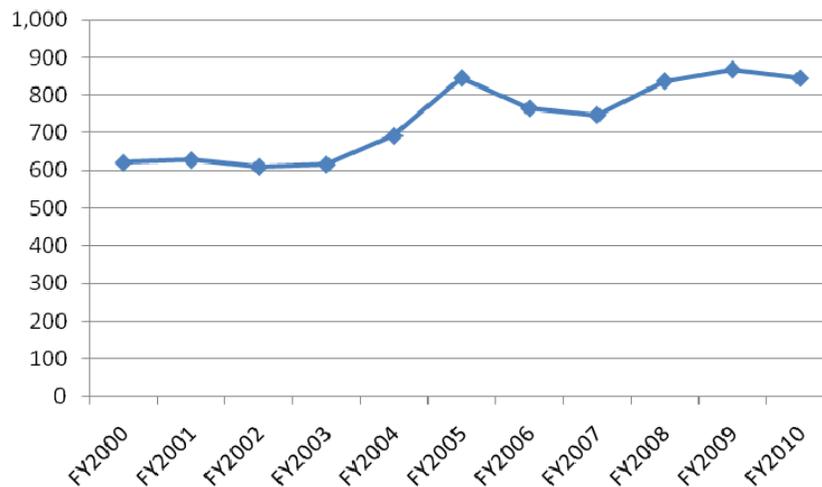
Factors that influence the differences between these two years irrespective of single stream collection include the economy, the collection containers used (e.g. carts vs. bins), and program marketing. In addition, some households that subscribe to curbside refuse collection may not have recycled because they had to make a special trip to drive recyclables to a transfer station. With the advent of single stream recycling, some haulers might choose to expand curbside services to offer recycling collection if there is the opportunity to tip mixed recyclables at a local transfer station. This may occur at Norway Paris but would be harder to accommodate at many of the smaller transfer stations since loose material cannot be quickly loaded into a container and bagged recyclables will not be accepted at the single stream processing facilities.

Single stream recycling collection also offers an opportunity for additional recycling in the commercial sector. This is because businesses that only recycle cardboard may use the same container for all recyclables adding bottles and cans as well as mixed paper to the cardboard container. In Chittenden County, Vermont, there was a notable increase in recycling among small businesses when single stream recycling became available. However this also may only be available at the Norway Paris Transfer station because of site constraints.

The Lamoille Solid Waste Management District (rural Vermont) experienced similar increases in recycling associated with the switch to single stream recycling. As in Oxford County, drop-off recycling is available at full service transfer stations located throughout the District. As shown

below in Figure 4, from FY 2000 – FY 2003, roughly 600 tons of material were recycled from the District’s population of roughly 25,000 at the transfer stations. During 2004, the transfer stations switched to single stream collection of recyclables and continued to the present, sending material loose and compacted in roll-offs to the Chittenden Solid Waste District MRF in Williston, Vermont. The increase in quantities were significant during a time when most communities saw a decrease in materials recycled (by weight) due to smaller newspapers, more on-line media and a continual light weighting of packaging.² Figure 4 displays the tons recycled from FY 2000 – 2010 in the Lamoille District.

Figure 4
Tons Recycled in Lamoille County, Vermont Before and After Single Stream Recycling



Reduction in Collection Storage Space and Number of Containers Used – All transfer stations would be able to use one large container to collect all recyclables. This could free up space at some sites for other materials, and save on labor costs at some transfer stations related to customer service and education, signage or handling and maintenance of individual containers. In addition, over the long term, container costs would fall since only one standard sized container would be used instead of eight smaller, custom sized containers.

Potential Reduction in Collection Transportation Costs – Only one container would need to be pulled from each location reducing the logistics associated with collection that OCRR has worked hard to manage and make efficient. (See discussion of transportation costs below.) Collection could be performed by any number of parties that own a roll-off truck, with the requirements being the ability to pull a 40 – 50 yard container with weights ranging roughly from 2 – 8 tons depending on material composition and if the material is compacted or not.

² Other factors may have contributed to increases or decreases during this time but DSM was not able to isolate them. DSM did analyze recycling trends statewide after the Chittenden District opened their single stream MRF and there was an increase in recycling statewide post 2003.

Disadvantages

The major disadvantages to OCRR and member communities of switching to single stream are:

Permanent Change - Once a community switches to single stream collection, it is nearly impossible to switch back to source separated recycling. This is primarily due to the education that would be required to retrain the public to separate materials. In the case of the OCRR member towns, it would also be very difficult to recreate the collection and processing arrangements that they have worked so hard to perfect.

Lack of Control – The Towns or OCRR would need to contract with a private facility to process their materials who would then dictate what could and could not be recycled. The Towns would no longer have the ability to independently decide the merits of recycling certain materials. In addition, the Towns would be reliant on using the same processor or finding a replacement if the terms for processing become more expensive and less desirable for the Towns over time. Because the towns are relatively small, they hold less bargaining power on their own.

No More Revenue Sharing – Over the past 6 years, OCRR collected around \$180,000 per year in revenues (See Figure 2) for materials collected and baled. With single stream processing, revenue sharing arrangements will not provide revenues at the same level, as discussed in the cost section below.

The other disadvantage typically cited are the losses in material recycled due to downgrading of materials at the MRF and/or losses of certain materials into other material bales (i.e. plastic bottles in paper bales, glass in paper bales, aluminum in plastic bales). This is specific to each MRF's equipment and operating record, and difficult to quantify. In addition even when crossover of material into different bales occurs, the material may be separated out at another location and still recycled. This could not be quantified for this analysis.

Costs

The costs to the Towns of single stream recycling collection were evaluated for comparison against the cost of the current OCRR recycling system. From DSM's cost evaluation, findings were that single stream recycling costs in the OCRR are primarily dependent on two variables:

Avoided Disposal Cost Associated With Increased Recycling - As discussed above, single stream recycling typically leads to increased diversion of materials from disposal. Each ton of material diverted to recycling saves on MSW transportation and disposal costs. Depending on the increase in recycling over current levels and the cost of disposal, which are both specific to each transfer station, these savings may be small or significant. Because many OCRR communities have relatively high disposal costs (as compared to other parts of New England and New York State) the savings from increased recycling could be significant. Table 11 shows current MSW disposal costs which range from \$56 to \$95 per ton.

Transportation Costs – Last year's cost to collect recyclables from each transfer station and deliver them to the OCRR processing facility was estimated at \$81 per ton. With single stream recycling, material would instead be transported directly to ecomaine in South Portland, or consolidated in 75 – 130 yard containers at a larger transfer station (e.g. Lewiston) for transportation to Casella Recycling in Charlestown, MA. Because the opportunity exists to

transfer materials from Lewiston to the Charlestown, MA at no cost, at least for the next five years, transfer from the Norway Paris Transfer Station was not considered. (Note that DSM did contact Casella Recycling about the possibility of extending the same offer to Lewiston to Norway Paris but does not have a firm price.)

Transportation costs per ton of recyclable material are based on two factors: distance from each transfer station to the processing facility used (e.g. Portland or Lewiston), and the quantity of material consolidated in each container pulled. Using a stationary compactor as many as 9 tons of material might be compacted in a 45 yard box, however depending on the amount of cardboard (and plastic) in the container, compacted weights could be significantly lower. For the purposes of this analysis, DSM used an estimate of 7 tons per container pulled for transfer stations that would be able to install compactors costing between \$25 and \$39 per ton, depending on the distance. For loose weights, DSM assumed costs between \$58 and \$75 per ton with higher costs for longer distances based on un-compacted weights of 2 to 3 tons per load. The light weight nature of single stream recyclables, especially if there are significant quantities of OCC, is one of the largest factors impacting costs. This is expected to be a factor in many OCRR towns because of the amount of cardboard collected.³

There are three other items important to the cost of single stream over the current source separated recycling system costs. These are:

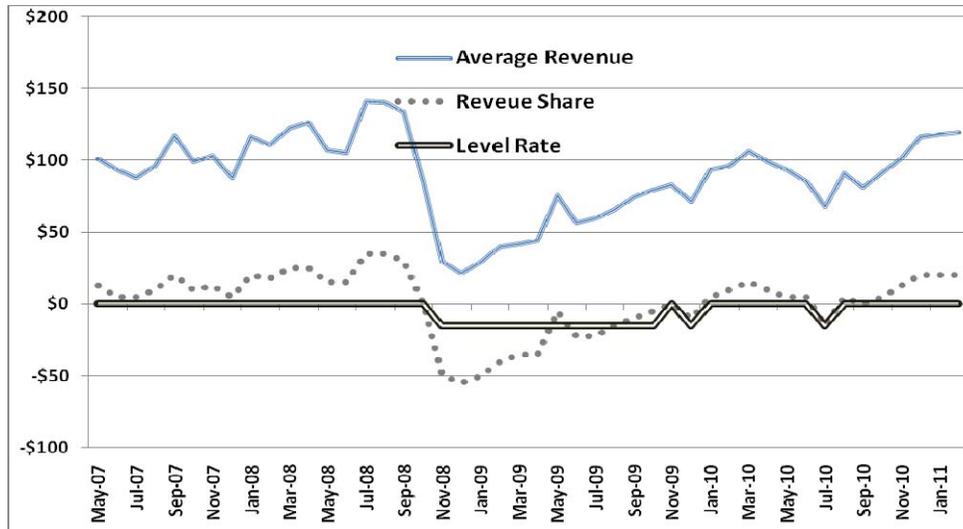
Processing Costs – At Ecomaine, communities can enter into a contract for processing and choose to pay either a fixed fee tied to the markets for materials but guaranteed never to cost more than \$15 per ton, or to engage in revenue sharing. With revenue sharing, communities enjoy 50 percent of revenues over (blended) material sales of \$85 per ton (a rate set just above the cost to operate the processing facility). Below this level, communities pay the difference between material sales and processing costs. Figure 5 below shows the average revenue from the sale of materials since May 2007, and the tip fee or revenue share per ton under these two arrangements. Between May 2007 and January 2011, the average cost per ton delivered under the level rate arrangement was \$5 and under the revenue share arrangement was a net (\$1.30) per ton. The average revenue per ton sold during this period was \$89 per ton. Finally, comparing only material sales for CY 2010, the average revenue per ton sold was \$94 per ton as compared to \$110 per ton for OCRR's material. This may be due in part to the high percentage of fiber in OCRR's material mix.

The other option would be to use the Casella Recycling facility through the Lewiston transfer station. This may be available at a \$0 tip fee up to a 5 year term as informally presented by Lewiston.⁴ For the purposes of this analysis, DSM has used ecomaine's two processing contract arrangements to show the impact.

³ However there would be a correlating increase in MSW material densities when cardboard and plastics are removed from the MSW container.

⁴ Telephone and e-mail correspondence with Robert Stalford, Superintendent - Solid Waste, City of Lewiston Department of Public Works, 103 Adams Ave, Lewiston, ME 04240. (Office Tel. 207.513.3147)

Figure 5
Material Revenues at Ecomaine and Costs/(Revenues)
Under Level Rate vs. Revenue Share Agreements



Capital Costs – Each transfer station would need to purchase or lease one or two 40 or 50 yard containers for single stream recyclables. Two containers may be necessary so that one can swap out an empty container when a full one is pulled and not have to immediately return to the transfer facility. In addition, at most higher volume facilities where three phase power is available, a stationary compactor should be installed to reduce the number of times the container would need to be pulled (and reduce transportation costs). For transfer stations with compactors, DSM has assumed an initial capital cost of \$30,000 for the equipment and site preparation at an annualized cost of \$4,200 (rounded). For NPSW, DSM has assumed a total capital cost of \$50,000 for new container(s) and any site preparation costs at an annualized cost of \$6,970. For the other sites, DSM has assumed an initial capital cost of \$12,000 at an annualized \$1,700 (rounded). Both annualized costs assume municipal borrowing at 7 percent over 10 years. It should be noted here, as discussed below, one purpose of maintaining the OCRR even if the decision is made to switch to single stream recycling would be to allow for sharing of containers, and a transportation contract, among the member towns.

Transfer Station Operations Costs – The last area where savings may occur are in the operations costs at each transfer station. These savings are hard to quantify and in some cases, unless there is a reduction in labor hours, there may be no savings at all. Assuming that each transfer station were able to save 10 percent of operation and maintenance costs (see Table 3), savings might range from \$2,500 per year in Otisfield to \$6,500 per year at the Greenwood Woodstock facility. However because these savings are specific to each transfer station’s operations, no savings were included in the cost analysis table that follows.

Table 13 (on the next page) illustrates the estimated costs associated with switching to single stream for each transfer station under three different scenarios: no increase in recycling, a 10 percent increase in recycling and 25 percent increase in recycling. Then, at the bottom of Table 13 these costs are compared with current costs. Note that current costs used are the assessment for CY 2010.

Table 13
Single Stream Recycling Costs (Annual, Estimated using 2010 data)

No Change in Recycling	Brownfield	Canton	Denmark	Gilead	G&W	Hebron	Lincoln Plt	Livermore	NPSW	Otisfield	Tri-Town	Upton	West Paris	Totals
Recycling (tons)	48	36	43	8	98	50	11	107	851	62	189	3	92	1,600
Capital Costs	\$1,672	\$1,672	\$1,672	\$1,672	\$4,180	\$1,672	\$1,672	\$4,180	\$6,967	\$1,672	\$1,672	\$1,672	\$4,180	\$34,554
Processing Costs														
Revenue Sharing	(\$63)	(\$47)	(\$56)	(\$11)	(\$128)	(\$66)	(\$15)	(\$139)	(\$1,110)	(\$81)	(\$246)	(\$4)	(\$120)	(\$2,086)
Fixed Per Ton Fee	\$220	\$164	\$195	\$38	\$447	\$230	\$52	\$488	\$3,886	\$285	\$862	\$15	\$421	\$7,302
Transportation Costs	\$2,805	\$2,336	\$2,494	\$629	\$3,843	\$2,944	\$666	\$4,195	\$21,282	\$3,635	\$14,156	\$257	\$3,231	\$62,473
Total Costs														
Revenue Sharing	\$4,414	\$3,961	\$4,110	\$2,290	\$7,895	\$4,550	\$2,323	\$8,236	\$27,138	\$5,226	\$15,582	\$1,925	\$7,290	\$94,940
Fixed Per Ton Fee	\$4,697	\$4,172	\$4,361	\$2,340	\$8,469	\$4,846	\$2,390	\$8,863	\$32,134	\$5,592	\$16,690	\$1,943	\$7,832	\$104,329
Increased Recycling (10%)														
Recycling (tons)	53	40	47	9	108	56	13	117	936	69	208	4	102	1,759
Avoided Disposal Costs	(391)	(431)	(352)	(80)	(989)	(595)	(126)	(1,180)	(7,640)	(698)	(1,736)	(28)	(891)	(15,138)
Capital Costs	1,672	1,672	1,672	1,672	4,180	1,672	1,672	4,180	6,967	1,672	1,672	1,672	4,180	34,554
Processing Costs														
Revenue Sharing	(\$69)	(\$52)	(\$61)	(\$12)	(\$140)	(\$72)	(\$16)	(\$153)	(\$1,221)	(\$89)	(\$271)	(\$5)	(\$132)	(\$2,295)
Fixed Per Ton Fee	\$241	\$180	\$215	\$42	\$491	\$253	\$57	\$536	\$4,275	\$313	\$948	\$16	\$464	\$8,032
Transportation Costs	\$3,086	\$2,570	\$2,743	\$692	\$4,227	\$3,238	\$733	\$4,615	\$23,410	\$3,999	\$15,572	\$282	\$3,554	\$68,720
Total Costs														
Revenue Sharing	\$4,298	\$3,759	\$4,001	\$2,272	\$7,278	\$4,242	\$2,262	\$7,461	\$21,515	\$4,884	\$15,236	\$1,922	\$6,710	\$85,841
Fixed Per Ton Fee	\$4,608	\$3,991	\$4,277	\$2,327	\$7,909	\$4,568	\$2,336	\$8,151	\$27,011	\$5,286	\$16,455	\$1,943	\$7,306	\$96,168
Increased Recycling (25%)														
Recycling (tons)	60	45	53	10	122	63	14	133	1,064	78	236	4	115	1,999
Avoided Disposal Costs	(\$977)	(\$1,078)	(\$881)	(\$199)	(\$2,473)	(\$1,489)	(\$316)	(\$2,951)	(\$19,100)	(\$1,744)	(\$4,341)	(\$70)	(\$2,228)	(\$37,846)
Capital Costs	\$1,672	\$1,672	\$1,672	\$1,672	\$4,180	\$1,672	\$1,672	\$4,180	\$6,967	\$1,672	\$1,672	\$1,672	\$4,180	\$34,554
Processing Costs														
Revenue Sharing	(\$78)	(\$59)	(\$70)	(\$14)	(\$159)	(\$82)	(\$19)	(\$174)	(\$1,388)	(\$102)	(\$308)	(\$5)	(\$150)	(\$2,608)
Fixed Per Ton Fee	\$274	\$205	\$244	\$48	\$558	\$288	\$65	\$609	\$4,858	\$356	\$1,077	\$18	\$527	\$9,128
Transportation Costs	\$3,507	\$2,920	\$3,117	\$787	\$4,804	\$3,679	\$833	\$5,244	\$26,602	\$4,544	\$17,695	\$321	\$4,038	\$78,091
Total Costs														
Revenue Sharing	\$4,123	\$3,456	\$3,839	\$2,246	\$6,351	\$3,780	\$2,171	\$6,299	\$13,080	\$4,371	\$14,718	\$1,918	\$5,840	\$72,191
Fixed Per Ton Fee	\$4,475	\$3,720	\$4,152	\$2,307	\$7,069	\$4,151	\$2,254	\$7,083	\$19,326	\$4,828	\$16,103	\$1,941	\$6,517	\$83,927

**Table 13
(Continued)
Single Stream Recycling Costs (Annual, Estimated using 2010 data)**

Comparison	Brownfield	Canton	Denmark	Gilead	G&W	Hebron	Lincoln Plt	Livermore	NPSW	Otisfield	Tri-Town	Upton	West Paris	Totals
Current Costs	\$5,093	\$3,934	\$3,889	\$621	\$7,449	\$3,716	\$156	\$7,647	\$28,680	\$5,870	\$15,898	\$212	\$6,068	\$89,233
Fixed Per Ton Fee														
<i>No Change in Recycling</i>	(\$396)	\$238	\$472	\$1,719	\$1,020	\$1,130	\$2,234	\$1,216	\$3,454	(\$278)	\$792	\$1,731	\$1,764	\$15,096
<i>Increased Recycling (10%)</i>	(\$485)	\$57	\$388	\$1,706	\$460	\$852	\$2,180	\$504	(\$1,669)	(\$584)	\$557	\$1,731	\$1,238	\$6,935
<i>Increased Recycling (25%)</i>	(\$618)	(\$214)	\$263	\$1,686	(\$380)	\$435	\$2,098	(\$564)	(\$9,354)	(\$1,042)	\$205	\$1,729	\$449	(\$5,306)
Revenue Sharing														
<i>No Change in Recycling</i>	(\$679)	\$27	\$221	\$1,669	\$446	\$834	\$2,167	\$589	(\$1,542)	(\$644)	(\$316)	\$1,713	\$1,222	\$5,707
<i>Increased Recycling (10%)</i>	(\$795)	(\$175)	\$112	\$1,651	(\$171)	\$526	\$2,106	(\$186)	(\$7,165)	(\$986)	(\$662)	\$1,710	\$642	(\$3,392)
<i>Increased Recycling (25%)</i>	(\$970)	(\$478)	(\$50)	\$1,625	(\$1,098)	\$64	\$2,015	(\$1,348)	(\$15,600)	(\$1,499)	(\$1,180)	\$1,706	(\$228)	(\$17,042)
Assumed Transportation Cost Per Ton	\$58	\$65	\$58	\$75	\$39	\$58	\$58	\$39	\$25	\$58	\$75	\$80	\$35	\$39

Alternative Management Practices

As agreed to at the Project Kickoff meeting, DSM also evaluated whether there were alternative management practices which would allow the OCRR to reduce current costs to be more competitive with the single stream recycling alternative.

DSM also evaluated potential ways to increase efficiency and/or reduce costs associated with solid waste management in general at the transfer stations. For recycling, DSM looked at both collection and processing performed by OCRR. The general conclusion, given the low throughput, is that the operation is relatively efficient. Somewhat surprisingly, as discussed in detail below, is that DSM assumed at the beginning of the analysis that collection costs could be reduced but instead processing costs appear to be an area where there is potential to reduce costs.

OCRR Recycling Collection Efficiency

DSM conducted a timing study of OCRR's collection of recyclable materials from two transfer stations, G&W and West Paris. The collection operation, not including transportation time to and from the facility, takes about 1 hour to collect and unload 1.98 tons of recycling materials for an average handling time per ton of 28 minutes. Transportation time will vary for each site depending on distance to the OCRR facility. Total time, including transport was 47 minutes per ton handled for West Paris and 60 minutes per ton handled for G&W. The photo at right shows the unloading of the collection containers which is generally done with one person.



The collection costs of \$69,500 (rounded) last year to collect 852 tons of material ran about \$81 per ton and encompassed nine material streams. This was done at a cost of about \$45 per hour (assuming 30 hours collection on average per week). DSM evaluated whether a front end loader would be more efficient. This would require a new truck (capital cost of around \$180,000), new containers (at least 8 per facility) which would come in standard sizes, and careful scheduling specific to each of the eight materials. Assuming that collection hours might be reduced by one-third by using a front end loader, DSM believes that there is not enough savings to make it worthwhile to switch to another collection system. This is because the current system for handling source separated materials is relatively inexpensive. If there were higher volumes at each transfer station, the outcome might be different. If the operation were privatized and required 20 hours per week, costs would still be higher even at \$75 per hour truck operating cost (including driver).

OCRR Processing Efficiency

DSM also looked at processing operations and costs. Baling times are relatively fast with bales made in 10 – 20 minutes. Looking at last year's throughput by material type and estimated baling times by material (as estimated by OCRR staff, not timed), it appears that roughly 12 hours per week would be spent actually operating the baler. Feeding the baler is relatively efficient, however DSM concluded that

the amount of time spent removing contaminants is probably high, and not cost effective leading to the higher costs to process materials at OCRR (estimated to cost \$117 per ton last year).

There are two ways to potentially reduce processing costs. First, increasing throughput, while maintaining the same labor costs, would reduce per ton costs. One of ironies of the current source separated system is that participation and capture rates tend to be lower than for single stream systems, leading to higher per ton processing costs at the OCRR facility.

Alternatively, it might be possible to reduce labor hours and reduce the amount of time removing contaminants. This might lead to some slight impact on bale quality and end market specifications being met. However, it is not clear that slight decreases in bale quality would necessarily result in reduced revenues. Again, as with the reduction in tonnage associated with source separated systems, single stream MRF operators have been able to achieve relatively similar overall revenues due to higher volumes of material and relatively robust demand for secondary materials in general. Again, DSM's conclusion is that the difference in revenues per ton of material marketed from ecomaine vs. OCRR is likely due to OCRR's material composition (with 83% paper) not the higher quality of the baled materials (even though DSM assumes that OCRR produces superior bales).

OCRR Universal Wastes, Electronic Waste, and Household Hazardous Waste

DSM reviewed the laws and rules in Maine with regard to Electronic Waste, Universal Waste and Household Hazardous Waste. Maine's Electronic Waste law (Title 38, Section 1610) requires shared responsibility between municipalities, consolidators, manufacturers and the State for the disposal of covered electronic devices. Municipalities can participate in the state collection and recycling system and deliver computer monitors, televisions, desktop printers and video game consoles from households only to a consolidation facility. A municipality may meet this requirement through collection at and transportation from a local or regional solid waste transfer station or recycling facility, by contracting with a disposal facility to accept waste directly from the municipality's residents or through curbside pickup or other convenient collection and transportation system.

Maine's Universal Waste Rule (Chapter 850, Section 3A) states that Universal Waste is: (i) Cathode Ray Tubes (CRT); (ii) Lamps; (iii) Mercury Devices; (iv) Mercury thermostats; (v) Motor Vehicle Mercury Switches; and (vi) Totally enclosed, non leaking polychlorinated biphenyl (PCB) ballast." The Rule requires that universal waste be stored in containers that "must not show evidence of leakage, spillage or damage that could cause leakage under reasonably foreseeable conditions. The containers must be closed, structurally sound, compatible with the content of the waste, and must not be leaking, spilling, dented or damaged such that it could cause leakage under reasonably foreseeable conditions;"

OCRR collects universal waste as defined by Chapter 850 Section 3A along with electronic waste such as computer towers from all of the communities that participate in the OCRR recycling program. OCRR does not receive state funding for collection and therefore must assess towns. OCRR could charge towns and businesses more for the UW collection to adequately fund this service, or charge user fees directly tied to tons of material delivered, and market costs.

While costs are relatively high to manage universal wastes, there are relative efficiencies gained because OCRR separates and consolidates materials for shipping. This enables all the towns to accept a wider range of materials at a lower cost than if each transfer station were to manage these materials on their

own. The collection costs are lower to each town because of the collection system with other recyclables. Some of these efficiencies would be lost if the transfer stations were to transition to single stream. One way to reduce costs might be to consolidate collection locations to only the larger transfer stations, particularly if the OCRR recycling collection route was replaced by single stream.

As an alternative, OCRR would make a single route for universal wastes and collect from all transfer stations on a regular schedule that was less frequent than the current schedule. To accommodate transfer stations with more materials, two or more containers could be used to hold materials between collection times. The same truck and containers could be used.

Bethel (Tri-town), Greenwood, Woodstock, NPSW, and Otisfield all work with Androscoggin Council of Governments to conduct an annual Household Hazardous Waste collection day. The other towns in the region can participate. Norway Paris Solid Waste Transfer Station and Bethel Tri-Town Transfer Station host the collection event. Increasing the number of events will increase costs so it is not recommended without additional state funding. Instead collection events sponsored by the disposal facilities might be pursued by the communities when negotiating disposal contracts with these facilities.

Management of MSW, Bulky Waste and CDD at the Transfer Stations

DSM evaluated transportation and disposal arrangements for MSW and Bulky/CDD for most member municipalities. Costs can be found in Tables 11 and 12 in this report. In general, privatized collection services appear to be less expensive when compared to Canton and Hebron who perform their own transport. This would suggest that the Towns are better served contracting for private transportation services.

Many facilities separate bulky waste and CDD from MSW because of the specifications for waste delivered to Mid Maine Waste Action Corp (MMWAC) in Auburn. Tip fees paid to MMWAC are relatively high, at \$80 to \$90 per ton reported to DSM by towns, although some of the disposal tip fees are embedded in a single price that combines transportation and disposal.

Other options for disposal in the region include: Mt Carberry in Berlin, NH; the Norridgewock landfill (operated by Waste Management); and, the Maine Energy Recovery Company (MERC) facility in Biddeford. Because the tip fees are relatively high for most of the towns, especially when compared to current spot market tipping fees, competitive bidding for disposal should be explored as discussed below.

For transportation, two options exist. First, the OCRR could take over transportation of MSW and CDD for all facilities and deliver waste to one or two disposal facilities (after negotiating a disposal contract on behalf of the municipalities). Second, the OCRR or NPSW could draft a RFP for solid waste transportation and disposal from all the member transfer stations and negotiate terms that would reduce costs overall for all facilities for both transportation and disposal.

For example, DSM contacted Mt Carberry Landfill about MSW and Bulky/CDD tipping fees and their current capacity. The following pricing was provided to DSM for both MSW and CDD/bulky waste disposal at Mt Carberry Landfill: Bethel would be charged \$67 per ton; Livermore \$50 per ton; and Canton, Denmark, Greenwood-Woodstock, Hebron, Norway-Paris, Otisfield, West Paris \$56 per ton. DSM was told that Mt Carberry Landfill could hold these prices for five years with no increase, and that

lower tip fees are offered to the communities with the longest travel distance in order to offset hauling costs.

It is possible that given these proposed disposal prices that the OCRR or NPSW could negotiate lower tipping fees at the MMWAC facility or at other Maine disposal facilities. Savings associated with reducing tipping fees could overwhelm potential savings associated with switching to single stream recycling and/or improving the efficiency of the OCRR processing facility.

Hauling costs for each of the transfer stations could potentially be reduced by consolidating services with one hauler and negotiating a group rate for both MSW and for Bulky/CDD. A request for proposal for hauling services for the 13 transfer stations (or 12 transfer stations if West Paris has completed their withdrawal from OCRR) could be issued with an option to use Mt Carberry as the disposal location. The same RFP could allow the hauler to quote an alternate disposal location of the hauler's choice. Note that if Mt Carberry were used, there may be no reason to separate MSW and CDD and bulky wastes except for recycling purposes as discussed below.

Another option available would be to negotiate a contract(s) for management of certain CDD and organic streams for the entire region in order to reduce the amount of material disposed and save on some costs. The following streams could be separated and managed for recycling:

Scrap Metal - Most transfer stations separate scrap metal which has value. Grimm Industries already collects scrap metal from a few transfer stations in the study region and will pay for the scrap metal or collect the metal free of charge.

Asphalt Shingles - Some of the transfer stations are already separating asphalt shingles. Commercial Paving and Recycling Group (CPRC Group) accepts the asphalt shingles. This could be expanded to other transfer stations and a better transportation cost might be negotiated if all transfer stations used CPRC Group. DSM spoke with Tom Kane from CPRC Group who said they charge \$48 a ton to manage asphalt shingles, not including the hauling fee which can range from \$185 to \$225 depending on the hauler chosen to transport the material to CPRC Group's Scarborough facility. CPRC Group has a Maine DEP Beneficial Reuse License and grinds the asphalt and mixes it with concrete and brick for use as a sub-base material for roads. They also sell ground asphalt shingles to paving companies and use it in the hot mix for their on-site paving company.

Gypsum - CPRC Group also charges \$48 per ton for separated gypsum, not including hauling fees. The gypsum is ground and used to amend soil with petroleum in it, it absorbs the oil and helps to bring the pH down. They also use it to mix it in with mulch and leaves or sell it to farmers as an inexpensive alternative soil amendment similar to lime.

Clean Wood - Tri Town and Frost Hill separate clean CDD wood from their demolition and bulky waste containers. While Frost Hill has this material ground and sells this for energy, Tri Town makes clean CDD wood available to residents.

Swap Shop - Finally, an active swap shop might reduce some of the bulky material from being thrown out if it is in good condition.

Other CDD Materials - CRPC Group charges \$50 per ton for demolition/bulky waste, not including hauling fees. The wood is pulled out of the demolition and Bulky waste to be ground for biomass plants and any other materials that can be easily recycled are removed with the balance of material disposed.

Monitoring is critical with separation of all these materials. Transfer station attendants should be monitoring the bulky and demolition waste for cardboard and other recycling materials as well as any separated materials for contamination that would interfere with recycling processes. As illustrated by the demolition and bulky waste photo taken from the G&W transfer station (at right), there is cardboard in the bulky container which could be placed in the OCRR cardboard collection container.



To further reduce cost, the towns could establish consolidated collection locations for which they share costs and offer the opportunity for all residents to use for certain materials. The consolidated collection locations have the advantage of reducing hauling fees per ton (from the location) and free up costs from the smaller transfer stations that administer and provide their own demolition and bulky collection programs. However, this arrangement also reduces convenience to residents and adds to their costs to deliver the material.

As discussed at the April 27, 2011 meeting when DSM presented initial results, one alternative to disbanding OCRR should the decision be made to shift to single stream recycling would be to use the OCRR, perhaps combined with NPSW to consolidate operations for the member towns and attempt to achieve savings through consolidated bidding and management of services. If the member towns are like other towns throughout New England, day to day management of solid waste is not a task that most selectboards willingly take on, and are typically happy to give up if an efficient alternative is available to them.

Privatization

Privatization of transfer stations has been a much discussed topic during the course of DSM's work in Oxford County. Over the past year, Norway Paris Solid Waste has been interested in whether significant cost savings at their facilities are possible through privatization, Woodstock was offered what appeared to be a cost saving proposal for privatizing the Greenwood & Woodstock transfer station and West Paris is finalizing a contract to switch to single stream and separate from OCRR. In addition Waterford recently left OCRR when single stream recycling collection could be offered directly by the private sector.

Over the long term, it is unclear how much savings will result through privatization. The National Solid Waste Management Association (NSWMA) recently published a research bulletin arguing that privatization of solid waste collection services could save between 20 and 40 percent in costs.⁵ However the Solid Waste Association of Northern America (SWANA) argued that conclusions could not be drawn from this 2011 study before there was a more "thorough analysis of data about the efficiencies and effectiveness of public versus private solid waste management services."⁶

NSWMA argued in the March 2011 bulletin and also in a 2001 bulletin⁷ that the main advantages to privatization are:

- Lower costs – NSWMA stated that the dual role of policy makers and service providers can lead to higher costs particularly because the service price can be driven by political considerations instead of cost minimization measures. In addition, they stated that private entities are better able to take advantage of economies of scale, spreading costs of some functions such as compliance, permitting, management and administration over more facilities (or activities).
- Safety – NSWMA argues that US Department of Labor statistics indicate an injury rate four times higher with the public sector over the private sector, and the number of days away from work typically 60 days greater per worker, and found the private sectors' record led to lower exposure to workers' compensation, disability and other claims.⁸
- Management Efficiencies – NSWMA states that private companies are apt to employ solid waste specialists, take advantage of appropriate technologies, access capital to purchase cost saving technologies faster, and use equipment more efficiently with more sophisticated maintenance and repair operations. In the 2001 bulletin, they also cited a 1997 study that found vehicle downtime was 16% for the public sector and 6% for the private sector.
- Quality of Service – NSWMA argues that introducing competition and freeing operations from the rules found within public bureaucracies enables service to be equal or better than the public sector.

⁵ *Privatization: Saving Money, Maximizing Efficiency, & Achieving Other Benefits in Solid Waste Collection Disposal Recycling*. The National Solid Waste Management Association, March 2011.

⁶ *SWANA Response to NSWMA Privatization Release*. MSW Management. March 25, 2011.

⁷ Jacobson, Alice P. *Competition in Owning and Operating Solid Waste Systems: Privatization Works Best*. NSWMA Research Bulletin 02-03. October 2001.

⁸ DSM did not check the backup data to this source.

- Risk Sharing – NSWMA argues that financial guarantees and insurance coverages offered through privatized operations can reduce risks to the public sector associated with managing wastes including some liabilities under RCRA. In addition, NSWMA states that the private sector has more experience than public officials assuming and managing commodity market risk and the volatility associated with sales of recyclable materials.

Cornell University researchers concluded that the primary reasons there is not more privatization are that: contracting is a difficult process; efficiencies can be hard to secure; and, the concern over public values (e.g. accountability, control, and public service benefits) are a major barrier. The primary gains of privatization are that it can ensure competition in cost and service quality, enhance internal efficiency, and offer some dependability in the case of contract failure.⁹

In addition, recent global research found that even though privatizing government solid waste collection and water distribution services were expected to deliver cost savings, there was no evidence to support this. The main factors to ensure cost savings occurred were cost characteristics of the service, the transaction costs involved and the policy environment stimulating competition.¹⁰

In light of this research, and DSM's experience working with collection contracting specifically, there are several areas for NPSW, OCRR and the member municipalities to consider with regards to the decision to privatize:

Operating Costs – Can the private sector operate the facility and/or perform the same service for less than current costs in both the short term, and the longer term? In general, private companies may be able to consolidate some management functions, employ workers for less and spread the costs of compliance, recordkeeping and administration over several facilities which all are likely to lead to lower costs. The question becomes how long can these lower costs be enjoyed under a contract? What about when the contract is rebid five or ten years from now? Will there be competition after one contractor has operated the facility for a period of 5 or 10 years? If there is no competition, can there be managed competition where the public sector competes to enter the marketplace and deliver the same service at a competitive price? Finally if the costs are lower, are the same services being offered? How much flexibility does the operating contract have to add in service requirements if something changes in the town or with regulations affecting solid waste management?

Capital Investment – Does the facility need capital investment and if so, can it be made more easily through privatization with the cost of debt incorporated into fees or a long term service contract? Should the length of the contract be longer to incorporate the full capital cost? Who owns the capital after the contract is completed?

Additional Revenues through Host Community Fees – Will the operating agreement include some type of host community fee (e.g. \$ per ton tipped)? Or will the facility be leased to the private operator or sold increasing the tax base in Town?

⁹ Privatization and the Market Role of Local Government, Economic Policy Institute.

¹⁰ Germa, Feganda and Warner. *Is Private Production of Public Services Cheaper than Public Production: A meta regression analysis of solid waste and water services.* Journal of Policy Analysis and Management. 29 (3) 553-577 2010.

Quality of Service – What service standards are required, and how tight can the performance specifications be made in the operating contract? The local jurisdiction will be relinquishing direct control over services but may still want to have some quality standards met. Where does the Town want the public to go with complaints? Will this change with a private contractor over the current practice?

Contract Monitoring and Responsibilities – Someone will need to monitor the contract and determine whether payments should be made or some form of penalties are necessary. How will success be measured and poor performance remedied? Also, is the local jurisdiction or the operator now responsible for regulatory compliance of the facility?

Other Recycling and other Solid Waste Management Services – How will other solid waste services be performed? Is there an opportunity to coordinate with other service providers?

In conclusion, it has been DSM's observation over the past twenty-five years that there is no inherent benefit associated with either public or private operation. The public sector can borrow money at less cost than the private sector, and can avoid paying taxes on the purchase and use of equipment. As such, an *efficiently run* public sector operation should, in theory, be able to compete effectively with a private sector operation. However, in practice, the lack of management expertise that often comes with part time selectboards, combined with a lack of specific expertise associated with the solid waste and recycling management field provides an advantage to the private sector, especially if the private sector also has more flexibility with respect to managing labor costs and hours.

In conclusion, the inherent risk with privatization is that Selectboards lose the ability to adequately judge whether long term costs are competitive, and as such, may begin with advantageous privatization agreements but over the long term lose the competitive advantage. The inherent risk with public operation is the lack of management expertise that many part time Selectboards have that makes it difficult to effectively manage a relatively expensive operation over the long run.

Given these considerations, the following recommendations apply to each facility.

NPSW Transfer Station

Privatization of the Norway Paris transfer station may make economic sense because a private operator who also does refuse collection may be able to increase the throughput of the facility lowering per ton operating costs. The current throughput at the facility is fairly low, making capitalization of improvements costly.

In theory a lower per ton tip fee could be negotiated for Norway and Paris residential waste. This tip fee would reflect the lower per ton operating costs. Together these savings could be fairly significant for the Towns.

In addition, a more competitive transportation and disposal cost (when the contract with MMWAC expires in 2013) might be negotiated along with the operating contract.

The operating contract should be competitively bid and should address performance standards, operating hours, fee structure to the public, and who is responsible for capital improvements and for regulatory compliance of the facility. This can be addressed by a well scoped RFP process.

Frost Hill Facility

The Frost Hill facility has the potential to be a regional facility for management of CDD and bulky wastes, whether or not it continues as a public facility or is privatized.

If Frost Hill is privatized, the contractor may be able to provide most of the services necessary to grind or otherwise process the material streams, or transport them for recycling or disposal off-site.

Frost Hill could also be a consolidation site for other member municipalities and could charge residents and contractors of the member towns a per ton fee to dump their demolition and bulky material to cover part or all of the costs to operate the facility. In addition to the resident's per ton fee, Frost Hill could charge the towns a small annual fee that can be used to subsidize some of the separation services that allow the flexibility to offer recycling services that may or may not be cost effective over the course of the year.

In order to administer the program, accurate scale records and fee schedules, and the ability to check residents' identification would be necessary. Member towns could be billed by Frost Hill based on the annual tons of the demolition and bulky waste dropped off by their respective residents. Lower fees for materials delivered separately and that incur low or no contractor costs (e.g. clean wood that is sold for energy or yard waste that can be composted on site) could be charged to residents/haulers and higher fees could be charged for materials that incur higher processing, transportation or disposal costs.

A fee structure targeted at the generator that encourages diversion and targeted at the town based on actual use would be an equitable way to cover the costs associated with the consolidation program and provide towns a net savings when diversion occurs. Frost Hill is an ideal consolidation center because of the new scale and existing administrative staff, however the distances will certainly limit participation to certain towns.

Frost Hill could also work with one or two of the larger transfer stations to collect and arrange transport of waste from those facilities and or to negotiate processing and transportation fees based on cooperative arrangements.

Cooperative Contracting Arrangements

As discussed in the previous section of this report, *Management of MSW, Bulky Waste and CDD*, cooperative contracting could offer some benefits to the member towns of OCRR and perhaps NPSW. The collective bargaining power may not only drive costs down but garner more interest and competition for operating contracts or materials processing as well as materials transportation and disposal. RFPs could be drafted for MSW transportation and disposal, Bulky/CDD Waste transportation and disposal, and management of scrap metal and appliances, tires, asphalt shingles, clean wood and gypsum wastes.

Recommendations and Conclusions

Based on the research done for NPSW and OCRR, DSM offers the following conclusions:

- Single stream recycling will save the town's money if they are able to increase recycling. Because disposal costs are relatively high, and commodity markets are predicted to continue to be strong, the difference between the cost to recycle and the cost to dispose is significant enough to favor recycling in the short term, and long term.
- The most effective method to ensure an increase in recycling would be to charge unit prices for disposal at the transfer stations and offer recycling free of charge. This could be done with single stream recycling or the current system of recycling. However in most cases, single stream recycling alone has been a driver in increased recycling because of the convenience offered to generators and the ability to store and deliver mixed materials.
- If some of the larger facilities switch to single stream recycling, it would make sense for all of the transfer stations to switch to single stream. A joint RFP might be developed that addressed this and universal waste management. It is important to note here that the OCRR depends on Norway/Paris for the lion's share of tonnage. It is important, if the OCRR is to remain a viable entity, that all member towns recognize the low cost impact of Norway/Paris on the OCRR facility given zero collection costs for Norway/Paris recyclables.
- Privatization of the NPSW facility could be pursued through a RFP and specification and contract terms that will alleviate responsibility to the Town. The proposals could then be compared against the current costs and service to determine whether a privatized operation will save money.
- A joint RFP for transportation and disposal (or recycling) of MSW, Bulky Waste, CDD, and special wastes (e.g. scrap metal, tires, appliances, asphalt shingles) could be developed for all of the Towns to increase their bargaining power, and in particular enable the smaller Towns to have some leverage.
- There may be a benefit to consolidating NPSW and OCRR into one organization for all the towns particularly if the NPSW facility is privatized, with a single unifying board and some type of voting structure that acknowledges the size of Norway and Paris as opposed to the smaller towns.