



October 13, 1999

Ms. Kate Bouman
Township Supervisor
Silver Lake Township
Box 1405 RR1
Brackney, Pennsylvania 18812

Subject: **Drop-off Recycling Program Redesign**

Dear Kate:

The purpose of this letter is to provide Silver Lake Township with the results of the effort of R.W. Beck in evaluating and designing a drop-off recycling program that reduces the handling of materials and number of trips to secondary markets. The present operation requires excessive handling of materials for storage and loading purposes. This analysis evaluates and recommends measures to reduce the handling of materials and improve the aesthetic of the drop-off area.

The current program has served the recycling needs of this ten-lake municipality for a number of years. Tonnage records from previous years have been examined to size equipment to be used to serve as drop-off containers and for transporting materials to markets or processing facilities.

ANALYSIS OF CURRENT SYSTEM

The current drop-off program accepts aluminum cans, tin/bi-metal cans, mixed newsprint, corrugated cardboard and clear, brown and green glass. Total quantities of each material handled for the past year and one half are presented in Tables 1 and 2. These quantities were graphed by material by month to determine the pattern in quantities of materials handled from month to month. Given that the Township has ten lake communities, the expectation was that the quantities of materials handled in the warmer months would be substantially greater than in the colder months. As the graph in Exhibit 1 shows, the fluctuation is not that significant throughout the year for most materials. The exceptions are mixed paper and clear glass. As the values in Table 1 show, clear glass is not shipped on a monthly basis. It is collected separate from the other materials in the back of a rear packer garbage truck with a greater storage capacity, therefore allowing the Township to transport clear glass on a less regular basis or generally once every other month. In sizing

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equipment for receiving and transporting materials, it is expected that the quantities handled will be largely the same throughout the year as illustrated by the graphs.

TABLE 1
1999 QUANTITIES OF MATERIALS DIVERTED
 (Pounds per Month by Material)

Item	January	February	March	April	May	June
Plastic	1320	1260	0	1360	1000	1340
OCC	300	900	0	1320	840	1280
Mixed Paper	8800	3100	0	13380	11000	15140
Tin Cans	1240	960	0	1460	1120	1060
Clear Glass	0	5180	0	0	8760	0
Brown Glass	680	360	0	0	580	440
Green Glass	110	1500	0	760	0	1180

TABLE 2
1998 QUANTITIES OF MATERIALS DIVERTED
 (Pounds per Month by Material)

Item	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
Plastic	1000	900	800	1460	1020	1160	1230	1200	1580	1160	1020	1340
OCC	920	880	600	980	1500	980	2430	1540	1420	280	1060	620
Mixed Paper	11360	6880	7420	14820	10100	12540	13530	11920	15380	14480	11360	13840
Tin Cans	1440	1200	1160	1820	1240	1260	1580	1200	1680	1160	1160	1300
Clear Glass	11020	0	4040	0	8460	0	0	11760	0	5280	0	8620
Brown Glass	540	680	0	820	0	520	1320	520	700	960	0	0
Green Glass	1180	1260	0	1360	0	940	2120	1060	700	1160	520	0

Currently, residents drop-off materials at the Township's Fairground on Saturdays throughout the year. There are typically three individuals staffing the drop-off each Saturday to direct residents on placement of materials and handle materials as required. The Township parks the rear packer for clear glass and a compartmentalized recycling vehicle for placement of other recyclable materials. Once the compartments are full, materials are placed in drop-off sheds for storage and later loaded into the recycling vehicle for transporting to an intermediate processor after the vehicles have been emptied of materials loaded directly during the drop-off day event.

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The intermediate market pays the Township for most of the materials delivered. Table 3 shows the price paid for each item each month for the first six months of 1999. The total revenue derived from the sale of these items is generally significantly less than the costs associated with operating the program. As shown in Table 3, the total revenue from the sale of materials for this six-month period was just over one thousand (\$1,000) dollars. The cost however, for this same time period is approximately three thousand (\$3,000) dollars, based on the following assumptions:

- Transporting materials required 52 roundtrips of approximately 60 miles per trip;
- Roundtrips took up to 3 hours of a paid Township staff's time;
- Cost of transporting materials is approximately \$1.00 per mile and includes the cost of the driver, fuel and a portion of the other vehicle related costs such as maintenance, insurance and repairs; and
- No costs are factored in for loading stored materials by paid Township staff into transport vehicles or other site related costs.

Therefore, for this six month time period the drop-off program cost the Township approximately \$2,000 exclusive of costs associated with managing the drop-off site and administering the program. Attachment 1 is a summary of all the trips required to transport materials from 1996 through 1999.

TABLE 3
1999 MONTHLY REVENUES BY MATERIAL DIVERTED

Materials Marketed	Revenue per Month for Each Material in 1999					
	January	February	March	April	May	June
Plastics	\$13.20	\$12.60	\$	\$13.60	\$10.00	\$20.10
OCC	\$0.75	\$11.25	\$	\$16.50	\$14.70	\$35.20
Mixed Paper	\$0.00	\$31.00	\$	\$133.80	\$110.00	\$264.95
Tin \ Bimetal	\$0.00	\$0.00	\$	\$0.00	\$0.00	\$0.00
Clear Glass	\$0.00	\$64.75	\$	\$0.00	\$109.50	\$0.00
Brown Glass	\$5.10	\$2.70	\$	\$0.00	\$4.35	\$3.30

Green Glass	\$0.00	\$0.00	\$	\$0.00	\$0.00	\$0.00
Totals	\$19.05	\$122.30	\$143.10¹	\$163.90	\$248.55	\$323.55

The intent in redesigning the drop-off program is to simplify the process to reduce costs associated with the program. Specifically, the collection and transport equipment will be sized to reduce the number of trips required to convey materials to the processing/market facility.

Additionally, the extra handling of overflow materials adds cost to the program by requiring staff to load the truck with stored material after it has been emptied at the processing/marketing facility. A new program will be designed with the expectation of reducing not only the number of trips to a facility, but also the extra handling of materials. However, unless material market values increase significantly, operating costs will continue to be greater than revenues, though potentially at a smaller margin than in past years.

PROPOSED PROGRAM

Changes made to the Township recycling drop-off program will be directed at improving the following program elements:

- Reduce need to store materials in drop-off sheds;
- Reduce number of trips required to transport materials to the processing/market facility;
- Improve traffic flow at the drop-off site on designated drop-off days;
- Enable residents to place materials in appropriate compartments without being subject to inclement weather; and
- Make the site more user friendly.

To accommodate developing a system that meets these proposed improvements, the Township is considering the following measures discussed below.

REDUCING STORAGE REQUIREMENT AND NUMBER OF TRIPS TO PROCESSING/MARKET FACILITY

COLLECTION EQUIPMENT UPGRADES

Currently, the Township uses one compartmentalized vehicle to collect and transport most materials collected. If two vehicles were available, one for paper items and one for containers, there will be less over-flow and more storage space on each vehicle for the designated materials.

¹ No data available, estimate based on averaging the revenue amounts from February and April.

Also, the technology of collection vehicles has improved since the Township purchased the existing collection truck that could allow for more volume of each material to be transported in a single trip.

New collection vehicles have a capacity range of 20 to 50 cubic yards, with prices ranging from \$50,000 to \$100,000 including truck chassis. The broad price range is a factor of options included with the collection bodies. For instance, there are models that are hand loaded, single or multi-compartment, tarp or permanent roofs, up models that are semi automated "top-loading" style and others that offer hydraulically controlled compression panels mounted in the body and provide for densification of materials.

To accommodate the needs of the Township's drop-off program, the specifications for the trucks should factor one vehicle being utilized for segregated containers with the other vehicle being used for paper items. The vehicle for containers should have between five to seven compartments depending on whether it is in the Township's best interest to separate plastics into two groups and bimetal and aluminum cans. The five proposed separations would include, clear, green and brown glass, aluminum and tin cans, and number one and two plastic bottles. The paper truck would be divided into two to four compartments depending on the extent of material separation at the collection point. Specifically, there would be one compartment for cardboard, one for newsprint and at least one for mixed paper or two subcategories.

Manufacturers of collection equipment have furnished materials on equipment specifications and estimated prices. Copies of the brochures provided have been attached to this report. This information has been used to develop recommended specifications for equipment to serve the Township's needs and determine estimated cost.

Collection Equipment Specifications:

- Body capacity of up to 28 cubic yards
- Aluminum construction
- Vertically adjustable compartment doors with spring loaded stainless steel handles
- Single lever latching and unlatching of compartment divider doors
- Nylon bushings at divider door hinge area
- Top hinged rear door with cam type latching device
- 17 ton scissors type hoist with body prop

These are general specifications for low-tech type vehicle. There is equipment available with larger body capacity up to 40 cubic yards and some that include on board plastic densifying equipment or compacting capabilities. These vehicles generally have moving parts that add safety risks to using the equipment. They also, typically are significantly more expensive some costing over \$100,000.

Given that the vehicles would be used for a public drop-off program coordinated by volunteers, it would be prudent to use equipment that offers minimal risk and maintenance issues. Also, the cumulative capacity of the two vehicles, approximately 56 cubic yards, should be adequate to handle the materials from a single drop-off day event.

The proposed prices for vehicles meeting the specifications above, one with six compartments, one with three and both with top cages for plastic materials that increase available capacity of each vehicle to 42 cubic yards are approximately \$65,000 each including delivery charges. Attached are price quotes furnished by an equipment vendor.

- Collection Equipment Total Estimated Cost (\$65,000 x 2).....\$130,000

FACILITY UPGRADES

Currently, drop-off events take place out-of-doors, regardless of weather conditions. This presents a hardship to volunteers and the residents bringing materials to the drop-off area particularly given the winter weather experienced in the Silver Lake Township region. To upgrade the operation, the Township is proposing to construct an enclosed poll barn to house the drop-off operation. It will be designed to accommodate parking the two collection vehicles on either side of the building and leaving an area in the center of the building for the residents to use to drive through and drop-off materials (see Drawing 1).

The building will be sited in the same general area as the proposed new municipal building. This will enable municipal staff to have continual oversight of the building. The area proposed for the structures is set back off the main thoroughfare approximately 950 feet. Therefore a road will have to be constructed to accommodate vehicle access to both structures. Additionally, the driveway at the drop-off center will allow for vehicles to enter from one side and exit from the opposite side of the building. The Township expects to asphalt an entire area of approximately 1,200 linear feet. The total cost to pave this roadway is expected to be approximately \$67,000. Since the roadway will serve multiple municipal applications, only a portion of the paving cost can be assigned to the recycling project. Given that drop-off events occur only one day per week, twenty five percent of the total cost, or approximately \$16,700 of the cost is assigned to this project.

The building has been sized to accommodate the through flow of traffic dropping off materials while the two collection vehicles will be parked on either side of the building for direct loading. The length of the building will allow for four (10' x 10') storage bunkers in each to the corners of the building. This will allow some space for storage of overflow materials if the need arises. The bunkers will consist of the two corner sides of the building with the third side being movable concrete road barriers.

Costs associated with construction of the building and roadway are estimated below:

- Drop-off Center (60' wide x 70' length x 17' 9" height) poll barn structure with corrugated steel walls and roof. Cost estimate based on 4,200 sqft @ \$30/sqft.....\$126,000
- Access Road (20' wide x 1,200' length)

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- Cost estimate based on 25% of the total cost – 2,666 sqyd @ \$25/sqyd.....\$16,700
- Site development (clearing, grubbing and excavation) – Land related costs
 - Cost estimate based on 20% building and road related costs.....\$29,000
- Engineering and administration – Project Development
 - Cost estimate based on 15% of total project cost (\$171,700).....\$26,000
- Project total estimated cost (Project Development, Building and Land Related Costs)...\$197,700

PUBLIC EDUCATION

The Township will prepare a brochure for distribution to residents that explains the process at the new facility and reinforces the importance of recycling. To prepare and produce enough copies for each resident the estimated cost is \$5,000.

TOTAL EXPECTED PROJECT COSTS

A summary of the total estimated project costs are shown below:

■ Project Development.....	\$26,000
■ Public Education.....	\$5,000
■ Collection Equipment.....	\$130,000
■ Building.....	\$126,000
■ Land Costs.....	\$45,700
	Associated
■ Total	\$332,700

The estimated cost for the entire project is calculated to be \$332,700. If the Township applies for and is awarded Act 101 – Section 902 grant money for the project, then up to ninety percent of the total project cost could be reimbursed to the Township. In this instance the actual cost of the project to the Township would be the ten percent match or \$33,270. Alternatively, this match could be made up with the lease value of equipment currently being utilized in the existing program.

CONCLUSION

- Silver Lake Township has offered drop-off recycling services to its residents for the a number of years using one compartmentalized recycling collection vehicle, a rear packer and a municipal dump truck.
- The existing program must be updated to replace the aging vehicles used to collect and transport materials drop-off at the Silver Lake Township Fairgrounds the site of the present drop-off location.
- The Township wants to relocate the drop-off area due to complaints from neighbors regarding the existing operation.
- The Township wants to enclose the drop-off operation to improve the working environment for volunteers and residents participating in the recycling program and to improve visual aesthetics of the operation.
- The Township also wants to improve the efficiency of the operation by reducing the handling of materials and the number of trips required to transport materials to intermediate processors.

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RECOMMENDATIONS

- The Township at a minimum must purchase new collection vehicles to replace the aging vehicles and improve the collection, handling and transporting of materials delivered to the drop-off site by Township residents.
- Ideally, the Township should relocate the drop-off operation and construct a building to house the operation.
- The Township should prepare an Act 101 – Section 902 grant application to request grant assistance to implement the project proposed in this report.
- The Township should encourage adjoining municipalities to participate in the drop-off program.

If you have any questions relating to the materials presented, please do not hesitate to call me at (717) 730-0404.

Sincerely,

R. W. BECK, INC.

Richard Schlauder

Director of Environmental Services

cc: Kathleen Kilbane, SWANA
Carl Hursh, PA DEP
Rick Schlauder, R. W. Beck
Debbie Miller, R. W. Beck