

December 24, 1998

Ms. Joanne Shafer  
Recycling Coordinator  
Centre County Solid Waste Authority  
253 Transfer Road  
Bellefonte PA 16823

Subject: **Rail-Haul Analysis**

Dear Joanne:

The purpose of this letter is to provide the Centre County Solid Waste Authority (Authority) with the results of R.W. Beck's analysis of an Authority owned and operated railyard facility for recyclable materials. The expectation is that the Authority would construct a siding extending from the railroad track that runs parallel with East College Avenue/Route 26, and an off-loading facility to accommodate storage and off-loading of recyclable materials processed by the Authority and to allow for additional space that could be leased by other businesses in the region.

This analysis looks at the costs associated with constructing a siding and off-loading facility and potential savings that would result from a change to rail-haul of processed recyclable materials to respective markets.

### **ANALYSIS OF PROPOSED RAIL-HAUL SYSTEM**

This analysis assumes that the Authority would construct the siding and off-loading facility on farmland acquired from Rockview State Correctional Institution directly west of the Authority's current facilities. The proposed operation would be situated between the Authority's operating facilities and Route 26. In developing the costs the following assumptions have been made.

- Siding would be a single spur approximately 800 track feet in length (as shown in Exhibit 1).
- It will require the installation of one turn-out.
- The off-loading facility's dimensions are 430 feet long by 105 feet wide.
- State grant program would pay up to \$100,000 of the siding construction cost or 50 percent of the total siding development project cost.

Table 1 summarizes the anticipated costs of constructing the siding and off-loading facility at the proposed site, exclusive of any costs associated with purchasing or leasing the property. The total capital cost for the project is approximately \$1.5 million. The largest portion of this cost is associated with the construction of the off-loading facility estimated at over \$1.3 million as shown in

Table 1. The value of developing a siding and off-loading facility is expected to be in the reduced transportation costs associated with rail-haul.

**Table 1**  
**SUMMARY OF SIDING/OFF-LOADING FACILITY CONSTRUCTION COSTS**

<i>ITEM</i>	<i>COST</i>
Track Cost 800 Feet at \$80/Track Foot	\$ 64,000
Turn Out (\$25,000 if CCSWA Contractor Installs)	\$ 25,000
Derailer & Bumper	\$ 5,000
Site Development Costs	\$ 20,000
<b>SUBTOTAL</b>	<b>\$ 114,000</b>
Contingency & Engineering 10% of Capital Costs	\$ 10,000
<b>TOTAL SIDING</b>	<b>\$ 124,000</b>
Off-loading Facility \$30/Square Foot	\$ 1,354,500
Rolling Stock 2 Forklifts / Transfer Vehicle	\$ 100,000
<b>TOTAL PROJECT CAPITAL COSTS</b>	<b>\$1,578,500</b>

## SIDING COSTS

The actual cost associated with developing the siding is estimated to be at least \$114,000 based on project assumptions. This price assumes track construction at \$80 per track foot and the turn-out installation at \$25,000. If the serving railroad requires that it build the turn-out, the price could be higher. The site development costs are a rounded up by a factor of the total construction cost, as is the engineering/contingency.

The actual length of the siding may need to be longer than the proposed 800 feet. The present design has a turning radius of 360 feet or a 16 degree curve, which is the minimum allowable curve in the rail industry. The industry prefers a minimum turning radius of 460 feet or a 12.5 degree curve. Therefore, the actual track length may be closer to 900 feet and cost an additional \$8,000 over what is shown in Table 1.

However, a representative from Nittany Bald Eagle Rail Road, the railroad serving the track where the siding is proposed, has suggested that the siding could be built closer to the track. If the siding was constructed closer to the track, less total track footage would be required to build the siding. In fact, the

representative indicated 150 less feet of track would be needed. This would also reduce the amount of unused land area between the track and the siding, and shifting the off-loading facility closer to the track opens more area on the other side of the facility to be used for the operation.

Regardless of the different factors discussed, using the dimensions in Exhibit 1 the installation would result in a cost to the Authority of something less than \$130,000.

Up to fifty (50) percent of this cost could be funded through a state grant program. The Pennsylvania Department of Transportation (PennDOT) offers a Rail Freight Assistance Program (RFAP). The Bureau of Rail Freight, Ports and Waterways administers the grant program, which provides financial assistance on a matching grant basis to owners and users of rail freight services. The grant is used to assist financially with maintenance/rehabilitation and construction of rail related projects. The construction of a new rail siding clearly falls within the eligibility parameters of this grant program. The grant will pay for construction costs up to \$100,000 or 50 percent of the total project cost, whichever is less, or up to \$62,000 toward the cost of constructing the siding based on the figures in Table 1. Attachment 1 is a complete application form for RFAP.

#### **OFF-LOADING FACILITY**

The facility proposed in Exhibit 1 is sized to not only serve the needs of the Authority, but to provide space for lease to third parties. As noted earlier, the dimensions are 105 feet wide by 430 feet long, with a wall height of 26 feet. It will be of a warehouse configuration and will cost approximately 1.3 million dollars to construct. This cost could be reduced significantly if the building is sized to serve only the needs of the Authority.

Prior to constructing a building as large as the facility conceptualized in Exhibit 1, the Authority should determine the potential for leasing space to third parties interested in access to rail-haul.

Another consideration would be to develop the building as the actual recycling facility. This would require the Authority to shift its operations from the current building down to the proposed off-loading facility, thus eliminating the double handling of materials that would result from processing recyclables in one building and moving them to a second for off-loading onto shipment vehicles (railcars). In Lackawanna County, the only public recycling operation in Pennsylvania presently shipping recyclables by rail, processing takes place in the facility that adjoins the siding. This allows for direct loading of the material into rail cars after processing. It also allows for the use of the rail cars to store the processed materials until a sufficient amount has been accumulated for shipping to market, thus reducing the storage space requirement inside the processing facility.

## **ROLLING STOCK**

The costs in Table 1 reflect \$100,000 for rolling stock. This value includes the financial resources to purchase two forklifts for use in the off-loading facility and a tractor trailer combination to transport materials from the recycling operation to the off-loading facility. It should be noted that constructing the off-loading facility as the recycling facility would eliminate the need for a tractor trailer.

## **TRANSPORTATION CONSIDERATIONS**

Currently, all recyclable materials processed by the Authority are transported to market via road-haul. The value of rail-haul is expected to be in a savings on transportation costs, enabling the Authority to transport materials greater distances if higher material revenues are available at more distant markets.

The primary difference between road-haul and rail-haul is the fact that the payload on a rail car is up to 150,000 pounds or 75 tons, while the payload on a tractor trailer is generally less than 25,000 pounds or 22 tons. This means that one rail car can transport up to three truckloads of a commodity to its respective market.

To determine if there is a cost advantage, this analysis compares the cost of shipping paper from Centre County to Northern New Jersey by rail and truck.

The cost for hauling one rail car with 75 tons of baled paper to Northern New Jersey would be approximately \$700. This cost is based on hauling contained completely within the Conrail service area, using the Conrail BC100B matrix. If any portion of the trip is on other shortline railroads, there would be some additional costs.

Road-haul transport of the same material would require three truck loads, assuming each truck carries approximately 22 to 24 tons of materials. The estimated highway distance from Centre County to a point in Northern New Jersey, such as Garden State Paper, is 450 miles one way. The cost to transport material in a tractor trailer is assumed to be \$1.05 per mile, which is the rate the Authority currently pays an independent hauler to transport a material to market. Applying these assumptions (three loads at 450 miles one way each at \$1.05 per mile and no back-haul charge), the cost to transport approximately 66 to 72 tons is estimated at \$1,418, or double the estimated cost to transport by rail.

All these numbers are subject to changes based on various conditions, however the change could be in either direction. The order of magnitude however, shows that the same amount of material can be shipped at about half the price by rail.

Using Centre County's 1997 tonnage figures for newsprint of 2091 tons, the cost to ship to Northern New Jersey would be approximately \$19,600 by rail and \$44,900 by road-haul. This represents a 56 percent savings for strictly transportation related costs.

For commodities that do not have the volume of newsprint, the time period to accumulate sufficient quantities to ship to market would be much greater. For

instance, it would take about four months to accumulate close to 75 tons of aluminum cans to fill a rail car. Currently, about one to two loads of crushed aluminum cans are shipped monthly. In this case a change to rail-haul would have an impact on the cash flow of the Authority's recycling operation.

Of course, the capital costs associated with constructing the siding and off-loading facility have to be factored into the overall cost of rail-haul. Assuming a project capital cost of approximately \$1.5 million after adjusting for the 50 percent grant for the siding construction, the annual capitalized cost over a ten-year period is estimated to be \$223,500. This number would need to be divided over all the loads shipped, to determine the impact on the overall cost of the project.

At this point it is difficult to ascertain how many loads would be shipped via rail because it is a function of markets and the markets' access to rail. However, the more loads of material shipped by rail, the lower the capitalized cost on a per load basis. Leasing space to third parties to spread this fixed cost over an increased number of loads would lower the cost impact even more.

For the newspaper scenario alone, in order for rail-haul to break even with road-haul, 310 loads would have to be shipped by rail to offset the capital cost.

Another cost factor that is difficult to quantify is that of loading processed materials onto a transport vehicle at the processing center, conveying the materials to the off-loading facility, and unloading from the transport vehicle and loading into the rail car. This is an added cost, because every time a commodity is handled it adds a cost to the Authority for that particular commodity. The impact of this cost could be significant to the overall economics of the project. This cost consist primarily of the man-hours required to handle the material and equipment operating costs.

## CONCLUSION

- It is not cost prohibitive for the Authority to construct a rail siding; however, the off-loading facility adds a significant cost to the projects overall capital cost.
- Rail-haul is about half the cost of shipping road-haul at least for the scenario examined in the study. This could fluctuate based on distance and rail systems used to reach required destinations.

## RECOMMENDATIONS

- The rail siding should adjoin the facility where materials are processed to maximize on the benefits of shipping materials to markets by rail.
- Unless the Authority has specific commitments from third parties to utilize space at the off-loading facility, then the facility should be sized to only meet the needs of the Authority.

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- The siding should be constructed closer to the services track, unless there is a specific site restriction. This will reduce the amount of track required to construct the siding.
- The Authority may want to consider purchasing rail cars for materials that require several months to accumulate a sufficient amount of material to ship by rail. Processed materials could be stored directly in the rail car until the required capacity is reached.
- Markets should be researched to determine if rail-haul provides a specific advantage as far as securing more favorable prices or sufficiently reducing transportation related costs.

While potential transportation savings make rail-haul an attractive option, there are conditions at present that add costs to the non-transport related activities that must be resolved to make it work effectively.

Sincerely,  
R. W. BECK, INC.

Richard Schlauder  
Director of Environmental Services

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