

H. EXECUTIVE SUMMARY - SOLID WASTE MANAGEMENT STUDY – KCI

Carroll County Solid Waste Management Study - Executive Summary

Carroll County retained the services of KCI Technologies, Inc. (KCI) to review its current waste management system and assist in planning for future solid waste management. The work is intended to support a new direction for the County after its withdrawal from previous plans to build a municipal waste-to-energy facility in partnership with Frederick County. Both counties have now formally withdrawn from the incinerator plan based on their concerns for cost and potential environmental impacts.

Solid waste management (SWM) for Carroll County requires a balance of risk, costs, and benefits. One of the main responsibilities of county government in Maryland is to provide for a safe and effective means of solid waste management. Owning and operating an in-County system of solid waste collection, processing, and disposal may be the least risky and most reliable way to manage solid wastes, as there is little or no dependence upon the private sector to provide cost-effective and environmentally acceptable solutions. However, the current in-county landfill capacity is limited, and capacity does exist outside the county at commercial landfills within an economical haul distance. The cost of obtaining additional in-County waste disposal in a local landfill may be too expensive, if it is even possible at all under the current regulatory environment.

At this time, the County relies on contract haulers to recycle and to transfer and dispose of solid waste at a cost that is aligned with the current regional market conditions. There is a contractual dependence upon the private sector to provide this service, both reliably and at a fair and reasonable price. The fact that the county does own and operate the Northern Landfill provides a measure of security to the SWM operation, as waste could be diverted to the landfill at any time, and for any reason. Should there ever be an interruption in contractual services; the County can react relatively quickly to the situation. This ability gives Carroll County a distinct advantage in negotiating contracts and in managing waste in general.

Though the County has established a “solid waste enterprise fund”, in practice it is not operated as an enterprise, per se. General funds have routinely been appropriated to fill any deficit in funding due to either a shortfall in revenue, or higher cost of operations. KCI strongly advocates establishment of a true “enterprise funding” approach that is self-sustaining and economically viable. The advantages, above and beyond the obvious obligation to manage the operation efficiently within an established annual budget, include the ability to fund future improvements through revenue bonds or similar financing, as opposed to reverting to the general fund when there is a need to spend beyond the normal operations costs.

Under the current Carroll County Ten Year Solid Waste Management Plan (2006), the County adopted the following objectives (summarized):

1. Minimize waste generation.
2. Facilitate recovery, reuse and recycling.
3. Maintain, at a minimum, the Maryland recycling mandate (now 35%).
4. Decrease the volume of residual waste.
5. Efficiently manage all County waste.
6. Provide facilities and programs needed to achieve goals.

7. Operate transfer to optimize delivery to other disposal sites.
8. Implement a policy of landfilling as the “last resort”.

Recently, Executive Order 01.01.2015.01 "Zero Waste Plan for Maryland" established a statewide commitment to "zero waste" planning, and states that the Maryland Department of the Environment will not issue permits for new municipal or land clearing debris landfill capacity unless applications were submitted before January 19, 2015. Though the enforceability of this Executive Order is considered by some to be questionable, it is nonetheless an indication of political sentiment towards less landfilling of solid waste in general.

This report was prepared in conformance with the scope of work provided by the County. Specific topics of interest were reviewed in detail, such as funding, disposal methods, and solid waste operations. KCI reviewed information provided by County staff, visited solid waste facility sites and engaged in discussions with County staff to explore the information provided and resolve doubts or discrepancies.

The County requested that KCI provide recommendations to achieve each of the stated objectives and to balance the Solid Waste Enterprise Fund so as to move it to a self-sustaining position. To do so, fees should be set at a minimum to balance the expenditures incurred in operating the system, plus accumulate appropriate contingency reserves. In past years, the Solid Waste Enterprise Fund has received substantial transfers from the County General Fund. The annual transfer has been on the order of \$2.5 million.

The most fundamental question that KCI has examined is whether the County should continue to export waste, or utilize its own Northern Landfill for disposal. KCI prepared a cost model to examine the potential revenue surplus or deficit for those two specific scenarios: **Scenario 1** considers that all waste received will be disposed of at the Northern Resource Recovery Park (NRRP); and **Scenario 2** considers that all waste will be transferred out of the County in accordance with the existing or future transfer contract. The model incorporates expenditure and revenue data received from the County and shows the following results:

If all waste is disposed at NRRP, about 13 years of capacity would exist before reaching closure configurations at the end of 2027. The Net Present Value (NPV) estimate of increased revenues minus reduced expenses for the thirteen year period would be about \$28 million. However, this does not include significant additional expenses as shown below.

Closure cost for the 80 acre landfill would approximate \$6 million to \$8 million, and at the point closure begins another solid waste management solution would have to be in place. Closure capping could be delayed for some period of years, but the obligation should be fully funded by the time the landfill is completely full. In addition, should the County proceed with Scenario 1 (all waste landfilled at the Northern Landfill), there is an immediate need to move the existing transfer station out of Cell 4 so construction can begin on Cell 4. We have estimated the remaining airspace in Cell 3 would accommodate about 8 months of waste landfilling should all waste be landfilled at the Northern Landfill.

Should the County adopt Scenario 1 (all waste landfilled within County), a number of future expenses must be considered. These include:

- Moving existing transfer station out of future Cell 4 airspace.

- Reconstructing a recycle transfer station.
- Constructing Cell 4 liner, leachate collection, landfill gas collection and other appurtenances.
- Constructing capping Cell 5.
- Acquiring land for construction of new landfill.
- Engineering and permitting for new landfill (assuming Executive Order is overturned).
- Constructing new landfill cells.
- Closure and post-closure monitoring for Northern Landfill.

Replacement of the NRRP with another landfill is estimated to cost \$48 million to \$50 million total, for a hypothetical 300 acre site (175 acres landfill) with an anticipated life of about 50 years. Assuming straight-line amortization of the cost of “consumption of the landfill airspace asset”, the annual cost is estimated at about \$1 million per year, and should be added to the operating costs to arrive at a total cost, including asset consumption. The existing remaining landfill airspace would be filled by year 2027, if we assume a standard waste compacted density (including cover) of 1100 pounds per cubic yard. Under **Scenario 1**, when the future costs for building new landfill cells and transfer facilities is taken into account, we have estimated a Net Present Value (NPV) **budget deficit of about \$18.8 million** over the twenty year planning horizon from 2015 to 2035.

It is not clear under Executive Order 01.01.2015.01 that it will be possible to permit new municipal waste landfill capacity in the State of Maryland after January 19, 2015. For the purposes of this study we have assumed that landfill replacement is not possible within the current site.

Under **Scenario 2**, if all waste were transferred the projected NPV would yield a **budget deficit of about \$57 million** through the 20 year planning horizon from 2015 to 2035.

Under the current fee and expense structure, adoption of Scenario 2 yields a significant enterprise fund shortfall, and unless a change in approach is implemented, such enterprise would continue to run at a deficit beyond the planning horizon.

This ongoing shortfall for both scenarios can be rectified through two broad sets of recommendations KCI has formulated in response to the need to balance the Solid Waste Enterprise Fund: 1) strategies aimed at enhancing the efficiency and cost effectiveness of the solid waste system as a whole; and, 2) improvements to existing facilities to reduce their cost of operation or enhance the ability to collect revenues from user fees. The recommendations are summarized as follow.

System Strategies

1. **System Benefit Charge (SBC):** Currently, other than the General Fund appropriations, tip fees at the Northern Landfill and the Hoods Mill convenience center are the most important source of funding for the Solid Waste Enterprise Fund. At current tonnages averaging about 95,000 tons per year, tipping fees would have to be raised about \$26 per ton in order to close the gap between revenue and expenditures. This increase would encourage many commercial haulers to travel to other disposal locations, thus reducing

the revenue even more. The County experienced this when tip fees were raised previously.

We recommend implementing an SBC to establish a stable mechanism for financing the Enterprise Fund, recognizing that all County residents benefit from solid waste services, including services not directly related to tonnage disposed of at the landfill. Implementing this recommendation will require hiring a municipal finance professional to design the SBC, implement an enacting resolution, inform and educate the public of the new charges, and implement the accounting system changes required to show the charge on property tax statements. Assuming that the SBC applied to all 62,400 residential households and 4,600 businesses equally, the annual amount per property would be on the order of \$35 to \$40 per year. The estimated cost to implement this recommendation is about \$250,000 with an estimated annual maintenance cost of about \$100,000 - \$150,000.

2. **Collection Districts:** Currently (8) eight different private collector/haulers service the unincorporated areas of the County and there may be considerable overlap in service areas among these different service providers. Generally, the establishment of collection districts with one collector for each district results in significant efficiency improvements over un-districted, county-wide hauler services. The increased efficiency translates to 1) reduced costs for collector/haulers, due to more efficient hauling, and potentially reduced administrative (billing) expense, assuming the County becomes the “customer”; 2) reduced costs for homeowners and businesses due to collector savings, and 3) potentially a revenue opportunity for the County (thus reducing a dependence upon an SBC or other funding source). Based on similar district collection implementations around the country, the average total savings is about 1/3 compared to non-district collection.

With about 42,800 households in the unincorporated areas of Carroll County, 1/3 of their current annual collection cost equals about \$72 per year, and so a total estimated savings of about \$3.0 million per year is possible. From a practical standpoint that savings must be shared by all parties, i.e., the haulers, the customers and the County, for district collect to benefit all parties. The estimated cost for the County to establish a collection districts program is about \$270,000, with an annual maintenance cost of about \$150,000, assuming waste disposal becomes a service billed to the county property owners. Thus, while it is theoretically possible to fund the entire enterprise fund deficit, a portion of the savings will be retained by the haulers, and a portion should also benefit the customers, leaving a portion to benefit the County’s enterprise fund (also benefitting the customers who are property tax payers). The proportionate share of the savings for each entity must be carefully modeled and apportioned for this type of system to be economically successful.

3. **Pay as You Throw (PAYT):** PAYT programs are predicated on a principle that waste generators should pay for waste collection and disposal based on the volume or weight of the waste generated. One private collector/hauler is already providing (PAYT) service to subscribers. If collection districts are implemented, we recommend that it would be an opportune time to implement PAYT, as they can be complementary. PAYT programs

typically result in a 20% reduction in waste volume, which would lead to a considerable savings for either of the two scenarios adopted by the County. For Scenario 2 as recommended above, a 20% reduction in waste volume would reduce the cost for out of state transfer by about \$1.0 million annually.

If PAYT were implemented as part of the current collection/hauler licensing process, there would likely be an additional administrative cost, similar to that of implementing the recycling requirement for existing collector/haulers. If implemented as part of collection districts bidding and licensing, there may be little additional cost for the County to implement PAYT. However, the need to administer the measurement (volume of waste) can complicate the process.

4. **KCI recommends eliminating the currently used County waste "coupons"**: The current system represents an indirect "giveback" to the General Fund from the Solid Waste Enterprise Fund with an estimated value in FY 2014 of about \$290,000. This represents over 11% of the current Enterprise Fund deficit. Elimination of the coupon system would also result in a small savings for administration of the program.
5. **KCI recommends performing a Waste Characterization Study**. It is difficult planning for waste recovery programs without knowing the content of the waste stream. A waste characterization study provides the volumes and types of materials to more accurately plan for programs and technologies as they develop. Such a study would provide valuable information to help guide decisions on solid waste management, though there is no urgency at this time to complete such a study. The estimated cost of performing a well-designed waste characterization study over a period of one year (four seasons) could range from \$50,000 to \$200,000 depending on study design.

Facility Improvements

1. Cap Northern Landfill waste cells to reduce leachate. Based on preliminary estimates and historical commentary, we believe the active landfill cell 3A is one of the major sources of leachate. Leachate hauling and disposal at the Westminster wastewater treatment plant currently costs over \$600,000 per year. We believe that Cell 3A can be temporarily covered (similar to the existing cover on cell 3B), therefore reducing leachate production by about 30%, and resulting in a cost savings of about \$200,000 annually. The estimated cost to cover Cell 3A is about \$800,000, theoretically resulting in a 4 year payback. KCI recommends that capping cell 3A be further investigated, in order to save leachate disposal costs.

The County has provided CIP funding to cap the side slopes of (filled) cells 1 and 2 to reduce leachate production. The estimated cost to cap the side slopes of cells 1 and 2 is about \$3.9 million.

2. From an operational and worker safety perspective, KCI recommends exploring reconfiguring the Transfer Station to avoid backing maneuvers. Cost savings from implementation of this improvement are difficult to project, as are potential costs of an accident. It is unlikely that there would be tangible cost savings in the transfer operation,

as the costs are a function of tonnage throughput. From an operational efficiency standpoint a smoother operation would mean less turnaround time for trucks unloading at the facility. Should the County adopt Scenario 2, however, any benefits would be long-term. The estimated cost of converting the transfer station loading and truck tarping areas to a "drive through" operation is estimated to be on the order of \$2+ million.

3. Improve Northern Resource Recovery Park Residential Convenience Drop-off to reduce drop-off time, which should help reduce traffic congestion. Cost savings from implementing this improvement are difficult to estimate, however improvement in site safety and reduction of risk for potential injury claims may make such improvements worthwhile. This improvement is estimated to cost about \$200,000.
4. KCI examined reconfiguring Northern Resource Recovery Park traffic flow to avoid long queues on Maryland Route 140. Long wait times and lines of traffic extending onto this busy highway create a safety concern and may discourage residents from properly disposing of their wastes at Northern Landfill. It was not possible to estimate a cost savings from implementing this improvement. However it is noted that implementation of the system strategies outlined above, including the System Benefit Charge, Collection Districts, and Pay As You Throw will reduce self-hauling to the Northern Resource Recovery Park, and thus lead to traffic reduction without major site reconfiguration.

Waste Processing

KCI reviewed the current state of the art with respect to solid waste processing technologies, and alternative conversion processes. Though there are currently many promising systems in development, including gasification, refuse derived fuel, and others, none was seen as significantly well-proven and economically advantageous to warrant a recommendation to the County for further investigation at this time. In addition, most of these technologies are positioned for larger scale waste flows than the County currently produces. KCI recommends the County track future developments in conversion technologies for potential application in the future.

Summary

Carroll County has chosen a different direction from the previous plan to invest in a regional waste to energy incinerator with Frederick County. The County is well positioned to continue the current practice of contract transfer and hauling to out of county disposal, while protecting and conserving its main solid waste management asset, the Northern Landfill. KCI recommends increasing the transfer and hauling to 100% of the inbound waste, such that essentially none of the waste is landfilled. The regional waste disposal marketplace should be monitored periodically to identify trends such as increased pricing, or lack of availability of disposal options.

System improvements are recommended to ensure the Solid Waste Enterprise Fund operates at a net balance, including set-asides for foreseeable future expenses and a "rainy day"

reserve to cover unexpected contingencies should they arise, without the need to recur to General Fund allocations.

Facility improvements are recommended to reduce certain operational expenses, especially the expenses incurred by leachate handling and disposal. Other recommended facility improvements are focused on enhancing site safety and traffic flow.

Though significant advances have been made in solid waste recycling and processing technology in recent years, none are so compelling as to warrant a major investment by the County at this time. We recommend periodically monitoring the marketplace in new technologies as well.