

Food Residuals in Dane County

Economic Impact at landfills

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It is estimated that approximately 12,000 tons of food residuals are landfilled each year at the Dane County landfill. This chapter looks at the expected economic impact of a complete diversion of these materials. These impacts can be prorated to a situation where less than 100% of all food residuals are diverted as well as at other landfills that currently received food residuals from Dane County.

In summary, it was found that there would be relatively minor net economic impacts, although there would be a substantial change in cash flow.

Loss in tipping fees, extension of landfill life

The major impact of the diversion of food residuals would be the removal of approximately 9 to 10% of the material currently received at the landfill, and the resulting tipping fees, with a reduced revenue of about \$350,000 to \$400,000 a year. However, this reduction in waste quantities also extends the life of the landfill, delaying capital expenses, and, eventually, the air space not used to landfill food residuals will be used to landfill other materials. Thus, the tipping fee revenue will not be lost, but delayed until the future. It may have a short term effect on tipping fees to meet budgetary cash flows.

In looking at both the delay in collecting tipping fees and the delay of capital expenses, it is concluded that while there is a change in cash flows, the overall cost is relatively small.

Changes in operating costs

Three areas of operating costs were identified that would be affected by diverting food wastes. First, the reduction of waste quantities would tend to reduce normal operating costs. Using the engineering rule of thumb known as "the 6/10ths rule", a reduction in material quantities of 10% might be expected to reduce normal operating costs by just over 6%, due to less wear and tear on equipment, less overtime, less fuel expenses, etc. However, it is doubtful that savings of this magnitude could be achieved, since the landfill operation hours would not change to the waste reduction that would be achieved, and landfill compact methods have been changed over the years so that compactors are continuously compacting material, rather than stopping after 3-5 passes over the waste.

A second area of reduction is in the control of odors and pests at the site, including bird control. Currently, the landfill spends about \$20,000 a year on these two activities. While total elimination of food could perhaps virtually eliminate the presence of birds scavenging food from the landfill, it is not clear how much of an odor reduction there would be. In any case, the maximum amount of reduction would not be the full \$20,000 currently spent on these activities.

A third operational expense that could be reduced is the expense for leachate treatment. Currently, the landfill budgets about \$50,000 a year to have the leachate treated by the Madison Metropolitan Sewerage District. The cost is based on a combination of the quantity of leachate and various quality parameters, including Biochemical Oxygen Demand (BOD), Suspended Solids (SS), Phosphorus (P), and Nitrogen (TKN). The charges for the quality parameters are much larger than the quantity charges. Removal of all food waste is thought by staff to potentially noticeably reduce the amount of these materials from the leachate. However, it is not possible at this time to calculate the potential reduction. The total savings would be significantly less than \$50,000 under the best circumstances.

Impact on revenue from electrical production from methane

Diversion of food waste from the landfill would also affect methane gas generation. At the Dane County landfill, a portion of this gas is captured and burned to produce electricity, for which the County receives approximately \$600,000 a year in revenues.

A detailed spreadsheet was developed to look at the impact of diverting food waste from the landfill, and email discussions were held with two nationally known researchers on landfill gas. Based on these discussions and our spreadsheet analysis, it was found that less than 1% of the captured methane gas is due to food residuals. Most food decomposes very quickly in either the aerobic or acid phase, not in the methane forming phases that arise later in the landfill. In addition, the food that does decompose in the methane-producing stage is largely in the upper layers of the landfill, where a relatively large percentage of this methane will likely escape to the atmosphere, rather than be captured, since these layers are either above where the gas extraction wells are located or are in areas where the top portion of the gas extraction wells are solid. In both of these situations, there is relatively less methane extracted than in the lower layers of the landfill.

In addition, removing the food waste material from the landfill results in being able to use this saved space for the landfilling of paper and other organic materials, which contributes a larger amount of methane gas to the collection and recovery system. For example, food, although readily biodegradable, has a gas generation per unit weight that is half the gas generation potential of paper.