

**THE ECONOMIC IMPACT OF A PROPOSED SOLID WASTE LANDFILL IN MORGAN
COUNTY**

**THE COST TO LANDOWNERS AND TAXPAYERS
OF REAL PROPERTY DEVALUATION
vs.
FINANCIAL BENEFITS TO COUNTY GOVERNMENT**

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I. INTRODUCTION

A Morgan County property owner has requested a zoning variance from the county that would allow 518 acres located one mile south of the City of Madison to be used as a landfill site. **The application is justified largely in economic terms, i.e., financial benefits to county government, the school system and taxpayers.** [9]

The purpose of this paper is to help property owners, taxpayers and government officials and administrators assess the economic impact of the proposed Morgan County regional landfill by reviewing:

- Estimated losses in real property value (“devaluation”) and corresponding decreases in local tax revenues
- Potential cost reduction and revenue opportunities for county government (“benefits”)

The economic impact of the landfill would not be limited to residents living in close proximity to the proposed location. Everyone owning property or paying taxes in the county would be affected. Elected representatives have an obligation to evaluate all claims and representations of benefits made by the applicant and to analyze other potential costs and risks associated with the landfill (none of which are discussed in the application) before making a final decision on the rezoning request.

Resources.

The landfill is not an ongoing project; it is a future event. Understanding how it will affect the community requires a variety of estimates, many of which contain variables based on circumstances and conditions that are at present unknown. This uncertainty makes it difficult to fully understand the risks and estimate the economic impact of a local landfill. Many data points needed to create estimates can be obtained only from the landfill application itself. Understandably, estimates provided by the applicant emphasize and in some cases exaggerate benefits while failing to mention associated costs. In addition, much of the applicant’s data is based on projections that involve extremely long periods of time during which landfill activities would occur (35± years, including start-up). This operational period would be followed by an equally long period (not considered by the applicant) when the aftereffects of the landfill would continue to exert influence on the surrounding properties and community as well as on the landfill site itself. **The landfill and its economic impact on the community would be multi-generational, exceeding the life span of almost every person currently living in Morgan County.** The decision whether or not to proceed involves assessing long-term risk and impact on future generations.

Landfill studies.

A logical starting point is to examine data gathered on other landfills currently or previously in operation elsewhere in the United States and Europe. These studies provide a broad range of data and conclusions but generally share a common theme: the uniqueness of each landfill location, size, quality of management, operating procedures, types and quantities of solid and/or construction and demolition waste accepted, etc. Moreover, the actual data provided by studies has to be used with care. Studies written or funded by landfill management companies, environmental activists, lobbyists, county planners, appraisers, real estate brokers, etc., offer a variety of perspectives on waste handling and land

management and often use data selectively to present analyses that reinforce specifically sought-after conclusions.

Some of the most widely used landfill studies precede Federal EPA Subtitle “D” regulatory protocols (1991) which led to the closing of thousands of non-compliant landfills (including several small landfills in Morgan County). As a result, modern landfills, though better regulated, are much larger in size and capacity (greater scale being necessary to offset the greater costs of regulatory compliance). They have a significantly greater impact on surrounding land and communities than many of those analyzed in previous studies. For this reason, greater weight has been given in this paper to results and conclusions from more current landfill studies, especially those that focus on large landfills (generally defined as those handling more than 500 tons of municipal solid waste (MSW) per day). **The Morgan County landfill, with an estimated daily capacity of over 1000 tons, is by any definition a large landfill.**

At the back of this paper you will find an annotated bibliography of some of the most recent and relevant landfill impact studies.

County Financial and Municipal Solid Waste Data.

In addition to relying on third-party studies, extensive use has been made of data from Morgan County and its governmental operations, most of which has been audited. More detailed analysis, much of which cannot take place unless the landfill has been in operation for an extended period of time and government budgets and land values have had time to adjust, will generate even better data and more accurate estimates. However, because of the extensive use made of audited and local data, the best- and less-than-best-case scenarios presented in this study are sufficiently accurate to support some definitive conclusions about the costs and benefits of the proposed landfill.

Data sources include:

1. Audited budget data including financial statements covering annual solid waste and recycling summaries obtained from Morgan County governmental departments. This is public information available to taxpayers and property owners.
2. Data on property assessments and the county tax digest from the Tax Assessors Office. Tax digests are reviewed annually by the State of Georgia. This is public information available to taxpayers and property owners.
3. Estimates of aggregate property parcels and values to a five-mile distance from the landfill by the Tax Assessor’s Office (made in May of 2010). This data is preliminary and has not been reviewed by the State but is available to taxpayers and property owners from the Tax Assessor’s Office.

It should be noted that audited budgets and tax digests provide historical data but are not necessarily predictive of future budgets or assessments. These have become less stable because of the current global economic crisis. The budget and assessment data used in this paper are from Fiscal Years 2008 and 2009 only. In 2010 we are seeing ongoing (though presumably temporary) devaluation due to the national real estate crisis. For these reasons, except where specifically noted, I have used real property data from the most recent audited tax digest - 2009. All valuation and millage rate calculations are expressed in 2009 dollars. Inflation, deflation and other variables might be expected to alter these figures over the full life of the landfill (35± years), but even setting aside the effects of the ongoing economic crisis, projections over a time span this long would be highly speculative.

This paper does not address the possible effects of a regional landfill on the school system or on the City of Madison budgets, facilities or infrastructures except to the extent that they would be impacted by decreased real property tax revenues. Under certain circumstances these other effects could be significant. There are also other potentially significant economic impacts not included in this analysis. These are mentioned at the end of the paper along with brief comments as to why they were excluded.

II. THE IMPACT OF A LANDFILL ON PROPERTY VALUES

Properties lose value (a process referred to as devaluation) when any major disamenity such as a nuclear power plant or landfill is built nearby. A series of recent studies indicate that all large landfills (defined as those accepting over 500 tons of waste per day) cause significant devaluation of residential properties in surrounding areas. Approximately 80% of all small landfills also cause measurable devaluation.

Understandably, those few studies that find no measurable devaluation are the ones most often cited by landfill operators. But whereas most studies include analysis of the sale of hundreds or even a few thousand properties surrounding the landfill, the studies that detect little or no measurable devaluation either have been based on statistically-insignificant numbers of buy/sell transactions (focusing on a single neighborhood, for example) or on small landfills located in rural areas remote from residential development where the best and highest use of adjacent land is for livestock or timber. Vacant property used for agriculture is least likely to lose value because of the presence of a landfill.

The basic rule of real estate valuation also applies to devaluation: location matters. The Morgan County landfill application has proposed a 500+ acre site located one mile from the City of Madison, the largest city in the county and home to 25% of the total county population. There are approximately 3690 parcels (2403 residential) within a five-mile radius of the proposed site. Size matters as well. The landfill would have a municipal solid waste (MSW) handling capacity of 1000+ tons per day, which would qualify it as a mega site. **Because of its size and location, the proposed landfill is certain to cause property devaluation in Morgan County.**

Factors Causing Devaluation

The question of how much devaluation will occur can only be estimated for a landfill that has yet to be approved. A landfill is a “one-off” event (like a regional mall) with no local real estate marketing studies available to help predict the impact it will have on properties in the surrounding area. As a result, we have to rely on studies of landfills in other communities to gain insight into this process. This means using data and conclusions about buyers’ decisions and property price fluctuations from geographical areas far away from the specific impact zone of a new landfill.

Determining why a property sells for a certain price is not an exact science. As an economic event, the buying and selling of real property is one of the most emotional of all market-based transactions. Despite whatever appraisals, assessments and records of past transactions may exist, the exact pricing of a piece of property being sold is an unknown until the moment a sales contract is completed. Even after a contract is signed negotiations for price modifications or other concessions may continue. Buyers can hold sellers accountable for years or even decades after the sale for alleged misrepresentations or other contractual issues that occurred during the sales process. Sometimes there is a reluctance to disclose the possibility of a significant future disamenity such as a landfill that might affect the property.

(Telling a prospective buyer that at some future point in time the property may be degraded by underground water or chemical pollution from a landfill does not help the sales process reach a happy conclusion.) Buyers sense risk (whether real or imagined, present or future) when considering property near landfills and expect these properties to sell for substantially lower prices. Concern about long-term risk is appropriate in the vicinity of landfills because of their long life and poor track record of environmental safety, especially in their later years. From the seller's standpoint, selling becomes riskier because of potential liability, thereby raising the cost of the sale. Property values decline accordingly.

What do studies of other markets indicate? Virtually every case study - and there are many - comes to a somewhat different conclusion. These differences can be very large. Estimated losses range from near-zero to 60% or more for individual properties in the immediate vicinity of a landfill (within one mile) and low single digits 0-2% to 25% for larger geographic areas or neighborhoods directly or indirectly affected by landfill operations (outward to five miles or more five miles).

Because of this wide range of results, we might conclude that every landfill situation is different and has to be analyzed independently. But a closer review of these studies reveals that, while estimates of devaluation may vary, actual results fall into two general categories based on the methodology used to conduct the study. One group of studies uses comparables – comparisons of selling price differences between like properties – to estimate probable selling price reductions necessitated by a nearby landfill. **But other studies - those using hedonic mathematical models and equations - detect significantly greater devaluation.** Because they analyze a larger geographic area (and therefore more housing units) around a landfill, hedonic studies are more appropriate for estimating the impact of the proposed landfill in Morgan County.

Devaluation Within a Two-Mile Radius

The first type of study focuses on a circle around the landfill that extends outward two miles from the landfill. The most prominent of which were conducted during the early 1990's when EPA Subtitle "D" regulations were calling for public and waste management industry comment on landfills. These studies rely heavily on the use of what real estate professionals call "comparables," the comparison of prices of completed sales transactions. Comparables are used regularly by appraisers and real estate brokers to determine an asking price for a property being listed for sale. Studies of landfill impacts on property values using comparables borrow this technique, but instead of starting at a two-mile point from a home being listed for sale, they start at a two-mile point from the landfill and work their way toward the landfill, gathering information about prices paid for houses and noting price decreases as sales occur progressively closer to the landfill. These prices are then compared with prices for nearly identical or at least very similar houses that are thought to be well beyond any possible landfill effects but still close enough to reflect any local attitudes that might influence real estate prices (proximity to a lake or ocean or to an upscale, ethnic or historically-preserved neighborhood, as examples).

A two-mile boundary for establishing real estate comparables is typical. It makes good sense, depending upon the size and geographical layout of the surrounding neighborhood. Using a two-mile boundary is also useful when studying devaluation caused by a major disamenity such as a landfill. Casual observation of a landfill leads to the common-sense conclusion that the greatest impact occurs within a two-mile radius because the most prominent physical disamenities of a landfill are on full display. These include viewscape pollution (despite tree buffers, a 250 foot high waste cell can easily be seen from two miles away), odor from decomposing waste, especially hydrogen sulfide, a pungent rotten egg smell (the distance over which odor spreads is dependent upon prevailing winds combined with average ambient

temperatures), atmospheric dust and contaminants (again depending upon prevailing winds), light pollution (work continues into the night on the working face of the landfill until all waste is covered), noise pollution (bulldozers, the sound of trucks or rail cars being emptied or moved), vermin infestation (flies, birds, rodents), etc. These are all what we recognize as sensory reactions to landfill proximity, things that can be seen, heard, smelled and touched.

(Some of the more serious disamenities impacting a two-mile radius – pathogens and methane gas to name two - cannot be easily sensed and so are of less concern to local residents even though they are arguably much more dangerous.)

The consensus of comparables studies of existing landfills is that devaluation averages 4 – 12% within two miles of a landfill processing more than 500 tons of MSW per day. This range is frequently cited in landfill evaluations.

Devaluation Beyond Two Miles

There is another substantially different methodology available for studying property devaluation caused by landfills. It relies on complex mathematical models using hedonic equations that assign value to a variety of both desirable and undesirable attributes important to a person purchasing property. These include things such as size (square footage or number of bedrooms), age and condition, size of the yard, etc. External amenities might include a good school system, easy access to local parks, playgrounds and neighborhood shopping, average income levels or ethnic composition of the surrounding neighborhood, strict zoning regulations, etc. Disamenities might include lack of whole-house air conditioning, visible criminal activity in the neighborhood, or proximity to a busy highway, nuclear power plant or landfill. Though developed in the 1970's and first used to estimate devaluation effects in the 1990's, hedonic models have become the most widely used method of estimating property devaluation in recent years.

The term “hedonic” is borrowed from a generally-accepted theory among psychologists which stipulates that a person's actions and behavior always have self-satisfaction as their ultimate goal. The use of this term and concept in the study of real estate transactions may seem a little odd, but the goal is to understand the buyer's state of mind and personal preferences when making a purchase decision on a piece of property. Ultimately, residential real estate purchase decisions have high emotional content. This can play a decisive role in determining the value not only of a specific house or farm but also of entire neighborhoods and communities. Feeling comfortable with where they live is of primary importance to most people.

The use of hedonic equations is an important breakthrough in estimating devaluation. **Hedonic studies show significantly higher levels of property devaluation than those typically found in studies based on comparables within a two-mile radius of a landfill.** The most likely explanation for this is that studies of larger geographical areas result in the inclusion of a greater number and variety of properties and neighborhoods than studies that focus on a two-mile radius. Areas closer to landfills tend to include fewer parcels. Instead they have a larger percentage of vacant, rural or industrially-zoned property typically found in the less populated areas. This is where landfills are normally placed. As any statistician knows, larger samples result in more valid results. Also, the accuracy with which the negative effects of the landfill can be measured is improved by a detailed analysis of relative buyer preferences for a large number of specific amenities rather than simply relying on price comparisons of completed transactions.

The hedonic approach alters the methodology of estimating devaluation studies in another important way. Instead of starting outside the landfill impact zone and working toward a landfill, hedonic analysis starts at the landfill and work its way outward. The reasoning is that, up to a certain point (the limits of the buyer's borrowing power, for example), a buyer will pay a higher price for a property to avoid the perceived unpleasantness of living near a landfill. Therefore, property prices will increase as a function of their distance from the landfill. An immediate effect of this approach is that the area where measurable devaluation occurs increases well beyond a two-mile radius from the landfill. In fact, the hedonic approach has difficulty identifying a specific distance beyond which there is no measurable devaluation. As a result, there is no easy-to-define cutoff point beyond which a landfill has no impact on prospective buyers. Instead, the buyer's negative perceptions based on landfill proximity remain but are eventually overcome by the positive perceptions of a larger house, good neighborhood, in-ground swimming pool, etc. At some point, the purchase occurs because the buyer places greater importance on the amenities than on the disamenities. Hedonic models show, however, that even as distance from the landfill increases and property values rise to what one might consider "normal" levels (comparable to prices being paid for similar properties much further away), devaluation continues to affect prices because of latent concerns about the existence of a landfill in the area and the potential long-term risks associated with it being there. This affects a seller's attitude in the future when pricing the house for resale and helps perpetuate the property devaluation caused by the landfill.

Hedonic studies have found devaluations significantly greater than the 4 – 12% suggested by the two-mile studies and have pushed the impact zone boundaries out to 5 miles (the current generally-accepted standard) and even beyond. A hedonic study in Baltimore, MD, found measurable increases in property value out to a distance of 7 miles. One of the most detailed recent studies assigned property value increases ranging from 17.84% to 19.90% at the 3.25 mile point outward from four different landfills in Franklin County (Columbus, Ohio), double the consensus of older studies.

Based on hedonic studies, estimates of from 5% to 20% of aggregate devaluation are reasonable, depending upon the concentration of value within several miles of the landfill and the size of the offending landfill. Devaluation occurs out to at least a five-mile radius and sometimes beyond.

Data points:

The significance of using a minimum five-mile boundary for assessing devaluation in Morgan County can be seen from the following data:

1. The radial distance from the proposed landfill site to the intersection of Washington Street and Main Street in Madison is 4.5 miles and from the landfill to the end of North Main Street where it intersects with the Highway 441 Bypass is 5.5 miles. **Most of the City of Madison would be in the five-mile impact zone of the proposed landfill.**
2. The furthest point in Morgan County from the proposed landfill site is approximately 15 miles north at the confluence of the Walton, Oconee and Morgan county lines. It is unlikely that there would be any significant property devaluation north of Bostwick (see attached map).
3. There are 3299 taxable parcels with a gross taxable value of \$786,000,000 within five miles of the proposed landfill site (data provided by the Tax Assessor's Office in May, 2010). This represents approximately 32% of all parcels and 36% of all 2009 net real property taxable value in the county.
4. There are 554 parcels within two miles of the proposed landfill site. (These are included in the 3299 taxable parcels in item three, above.) These parcels would be subjected to the most intense devaluation because of their location.

Additional Factors Affecting Devaluation.

Devaluation is a complex process and there are many other factors that influence the final price paid for property once a large disamenity, such as a landfill, exists in an area.

1. **Devaluation is contagious.** The selling price of a house affects the value of all other houses in the neighborhood and geographical area where the property is located. A major disamenity like a landfill affects both owners and buyers. Property owners begin selling (or at least thinking about selling) to “get out” before any actual problems occur, the assumption being that it is only a matter of time before something goes wrong at or near the landfill. Buyers also respond immediately, becoming more cautious about moving into the area as information about the landfill spreads. This combination of anxious sellers and cautious buyers cause property prices to decline even if there is no empirical evidence that the landfill is causing problems. Owners hoping to sell are forced to lower their asking price. When this happens, entire neighborhoods lose value as one home after another is either sold at a reduced price or remains unsold for years even though the asking price is deeply discounted.

2. **Larger, more expensive or elaborate homes experience greater devaluation.** This is especially true where larger homes are located adjacent to or co-mingled with smaller homes (the effect is part of a phenomenon known as spatial variation). Just as the “cheapest house on the street” appreciates more during periods of price inflation, the “most expensive home on the street” declines more as a result of the devaluation caused by a large disamenity.

3. Traditionally, out-of-town buyers of property pay higher prices than local buyers in situations where disamenities are devaluing property. However, this phenomenon (a result of what is known as information asymmetry) is becoming less of a factor in home sale prices because, thanks to the internet, buyers can quickly gain knowledge about an area by themselves instead of relying on the representations of a real estate broker or the homeowner. The internet provides access to maps, statistics, news articles and other information which ultimately is likely to reveal the presence of a major disamenity. **Greater information symmetry has the effect of lowering purchase prices paid by newcomers and, because houses are priced using comparables of all houses sold in a neighborhood or community, lowering purchase prices throughout a neighborhood.** This increases measurable devaluation caused by a landfill and may help explain lower devaluation percentages found in pre-internet sales transactions by comparables studies completed in the 1990's.

4. **A significant factor in declining home prices is “offers not made” due to negative buyer reaction to local disamenities.** There is no way to measure these lost sales opportunities. But their impact both on the seller and on surrounding properties is generally thought to be severe. As prospective buyers discover a major disamenity and decide not to even make an offer on a property, the property remains on the market unsold for weeks, months and even years. Successive cuts by an ever-more-motivated seller will eventually bring the asking price down to a level where someone will buy it, but only at a steeply-discounted (devalued) price. This affects the value of all other properties in the area as real estate brokers re-price properties downward based on comparables.

5. **The “Stigma” Effect.** This is a “socially constructed estimate of property value,” a perception based on something other than actual dollar estimates of a property's market value. Although it may take years

from time of approval to first day of operation for a new landfill, property devaluation begins to occur immediately when a landfill is approved for construction. In fact, studies have shown that devaluation begins with even the rumor of a landfill coming to an area. (There is anecdotal evidence from local real estate brokers that this is already occurring in Morgan County.) The explanation for this is that the reputation of an area is debased by the presence of a landfill even before any actual effects of the landfill can be measured or detected. In this context the word “stigma” means “shame.” **Property owners are embarrassed by the fact that they live near a landfill.** The perception is that landfills are not desirable neighbors and that living conditions in the area will not be as good if there is a landfill nearby. This “stigma” can extend to entire neighborhoods and communities. Property values decline accordingly.

Estimates of the Effects of Devaluation on the Fair Market Value of Property

The various devaluation models discussed above help explain the causes and effects of devaluation. They can be used to develop some reasonable estimates of the financial losses to property owners caused by the fair market devaluation of property within a five-mile band around a landfill. Once fair market devaluation is estimated, we can estimate the tax revenue losses for county government and the school system caused by the decline of net taxable real property values within that five-mile radius.

Data points:

1. The fair market value of all real property in Morgan County in 2009: \$3,250,000,000
2. The fair market value of all real property within a five-mile radius of the proposed landfill site: \$1,172,000,000
3. The gross taxable value of all real property in Morgan County in 2009: \$1,300,000,000±
4. The net taxable value of all real property in Morgan County: \$1,061,000,000±
5. The net taxable value of all real property within a five-mile radius of the proposed landfill site: \$314,400,000

Devaluation affects property values at two levels. Property can be valued at full fair market (appraised) value, which is an estimate made each year by the Tax Assessor’s Office. This is the total value of all real property in the county (real property is real estate, not movable property such as automobiles, etc.) as if it were sold at a negotiated price on the open market in arms-length transactions. This total value is recorded in the annual tax digest where it is broken down by individual parcels. The Tax Assessor’s Office adjusts appraised values each year as conditions warrant.

- **Property owners lose equity when the fair market value declines.** •

Property can also be devalued at the net taxable real property level. Net taxable real property is determined by taking 40% of the fair market value (described above) and then subtracting a variety of exclusions and exemptions to arrive at a figure for net real property taxable value. This amount, which varies from tax district to tax district because of differences in exemptions allowed, is used in conjunction with millage rates set by each tax district to generate tax revenue to meet budget requirements. Because appraised values change each year, net taxable values and millage rates also change.

• Taxing authorities (county government, schools and cities) lose tax revenue when net taxable real property values decline. •

Given sufficient resources and time, the best way to arrive at an overall estimate of the impact of devaluation either on property owners or tax districts would be to assess each parcel individually and then calculate the probable selling price based on specific details about each property using a hedonic model or equation(s). This is impractical given the amount of time required and the number of parcels in Morgan County. An alternative is to use the aggregate totals from the annual tax digest to estimate:

(1) the impact of devaluation on the most recent (2009) fair market value within the landfill impact zone (a five-mile radius).

(2) the net real property tax digest within the landfill impact zone (a five-mile radius). This is the amount used to calculate millage rates.

Working with aggregate amounts allows us to determine the total value of losses of all properties but not the loss of any individual parcel. Individual devaluation per parcel will vary from near-zero to very high depending upon all of the factors that would be included in a hedonic model.

Based on what we know from hedonic studies of devaluation at other landfills, we should expect that almost all of the full market devaluation will occur within a five-mile radius of the proposed landfill site. This does not mean that properties outside the five-mile radius are not affected, however, only that the effects are insignificant compared with properties inside the five-mile radius.

On the other hand, devaluation of the net real taxable property digest affects all landowners because tax calculations (increases or decreases) apply to all taxpayers, not just to those who have lost real property value. When aggregate valuation drops within the five-mile radius, tax revenues may decline, and all taxpayers may experience a tax (millage rate) increase.

• What happens to net taxable real property values inside a five-mile radius landfill impact zone will affect all taxpayers both inside and outside the five-mile zone. •

Figure 1 shows the fair market value lost by landowners at four estimated levels of devaluation. The levels selected are in line with devaluation studies using hedonic models applied to a variety of large landfills discussed earlier in this paper. Aggregate losses of this order of magnitude would have a significant effect on individual property owners including both residential and commercial.

Figure 1. Fair Market Property Value Losses Within a			
Five-Mile Radius of the Proposed Morgan County Landfill			
2009 Fair Market Value: \$1,172,000,000			
	Estimated		Property Value
	Devaluation		Loss
	%		\$
	2		23,440,000
	5		58,600,000
	10		117,200,000
	15		175,800,000

When Does Fair Market Devaluation Affect Property Owners?

It must be noted that recognition (in economic terms) of devaluation occurs quickly on paper, but actual monetary loss may be delayed for years or even decades for individual property owners. A large devaluation event such as a landfill would affect the tax digest immediately. It would likely be completely incorporated into property values by the tax assessor within a year or two of approval. All other events linked to a decrease in the tax digest, including reduction of revenues and the necessary adjustments of budgets and millage rates, would follow suit in short order. But, except for the effects of these adjustments (which could include tax increases), there might be no direct effects on individual property owners in the short term. (There are exceptions: mortgage refinancing, home equity loans and reverse mortgages may be affected immediately by real property devaluation.)

The absence of any short-term effects does not mean that the devaluation of property that occurs is a paper loss only. But the real (out-of-pocket) loss is delayed. Why? Because in terms of revenues to the seller, actual monetary (cash as opposed to estimated) devaluation losses are recognized (again, in economic terms) only at time of sale. A property that would have otherwise been worth \$100,000 but has been devalued 5% by the presence of a landfill will be sold for \$95,000. The seller would lose \$5,000 on the sale and receive \$5,000 less cash as part of the final settlement. But no actual cash would be lost until the property is sold.

The fact that this loss occurs all at one time and comes at the end of the ownership cycle makes the loss less real and therefore of less concern to many property owners. Nevertheless, **devaluation, the exact amount of which can only be estimated by the tax assessor when a landfill begins operation, represents real loss and eventually becomes a real cost to the surrounding community.**

By contrast, many of the benefits to current property owners promised in the landfill application (reduced property taxes due to improvements in government budgets, as an example), though involving much smaller amounts of money, are immediate (annual) and are likely to receive greater attention as annual budgets are being prepared. Good news (a positive impact on county budgets) travels fast. Bad

news (substantial losses due to the devaluation of property) is delayed, sometimes for years or even decades, until the property is sold. But eventually the losses occur.

Average Frequency of Property Transactions

This raises the question as to how long the loss is delayed for each individual landowner. This will depend upon the property transactions rate (how soon after the devaluation occurs each parcel is sold). Some land remains in the same family for generations and is passed on as gifts or through inheritances, never actually being part of an arms-length market transaction. But most parcels are sold on the open market. Many sell quickly as owners relocate to take a new job or trade up to a larger house as a family grows. Property speculation (“flipping”) also accelerates turnover, although recent disruptions in the mortgage market may be temporarily slowing this process.

A good way to determine average property turnover frequency is to look at the average lifespan of residential mortgages. Most homes are purchased with a mortgage that is then paid off when the property is sold. The new buyer is also likely to take out a mortgage to finance the purchase. This is not an absolute way to judge real property turnover. Some houses are bought and sold for cash. Some mortgages are refinanced by the current owner and the property does not actually change hands. But over the past few decades the results have been fairly consistent: the average life of a residential mortgage is seven years and the mortgage is almost always paid off because the property has been sold. Any pending devaluation such as might result from the siting of a local landfill occurs at that time. The seller receives less money; the new owner purchases the property at a devalued rate. The new arms-length price is recorded at the Tax Assessor’s Office and the assessment of the parcel is adjusted accordingly. Unless some new devaluation incident occurs, devaluation caused by a new landfill is a one-time event. **The property owner of record when the devaluation occurs incurs 100% of the losses.**

The reason for discussing average property turnover rates is that any losses incurred by individual property owners who own property for an average of only seven years will not likely be offset by benefits provided by a new landfill. The applicant claims that substantial benefits (including potential tax reductions) will result from the landfill. However, these will be spread over a 30-year period. The primary benefit would be hosting fees paid to the county. The payout of hosting fees (and related property taxes) are low in the early years of landfill operation because it takes time, sometimes years, for waste handling volume to grow to projected maximums. During that time, benefits are insignificant. Using the example of the \$100,000 house that sells for \$95,000 in the seventh year when (on average) the house will be sold, the owner will lose \$5,000 but only gain whatever benefits were paid out during the first seven years of landfill operation when benefits are at their lowest. Only property owners planning to own the same parcel for decades are likely to receive full benefits. For most landowners, it is unlikely that the benefits estimated by the landfill applicant will ever offset the substantial loss of property value due to devaluation as shown in Figure 1.

Estimating the Effects of Devaluation On School and County Tax Revenues

Data points:

1. There are approximately 11,500 taxable parcels in Morgan County, 3690 of which are within a five-mile radius of the proposed landfill site. The 3690 parcels include 128 within one mile, an additional 426 between one and two miles and 3100 between two and five miles.

2. There are 2401 residential parcels (homes) within a five-mile radius of the landfill site.
3. The fair market value of all real property in Morgan County: \$3,256,000,000. Of this total, 36% or \$1,172,000,000 is situated within a five-mile radius from the proposed landfill site.
4. The aggregate net taxable property value is \$1,061,000,000 for the county and \$1,057,000,000 for the schools, net of all exemptions. (The slight difference between the two is due to varying exemptions.)
5. The aggregate taxable property value within a five-mile radius of the proposed landfill site: \$314,400,000, net of all exemptions.
5. There are seven tax districts in the county: the county itself, the school system, four cities and a City of Madison Lighting district (consisting of two zones, community and interstate).
6. Millage rates for taxing districts in 2009 (the most recent approved rates) are as follows:
 - County: 8.178
 - School: 12.461
 - City of Madison: 5.241 (including Lighting Districts)
 - City of Rutledge: 3.734
 - City of Bostwick: .0970
 - City of Buckhead: 2.105

There is also a State of Georgia property tax. The millage rate in 2009 was .2500.

The Tax Digest.

A brief explanation of how the tax digest is assembled and then used to determine tax rates will help clarify how devaluation affects county-wide millage rates and tax revenues.

The Tax Assessor prepares an annual digest listing all parcels in the county together with an appraisal of the fair market value of each parcel. The value of all individual parcels is then combined to determine the total (aggregate) value of all real property. These values are only approximate, meaning that they are educated estimates of actual value. This is because the actual value of a parcel can only be estimated until it is purchased by another party in an arms-length transaction. When that occurs, an actual ("fair market") value is established. Prior to that, the parcel's value is initially determined by the current owner's purchase price (a prior arms-length transaction) which is then periodically adjusted upward (inflated) or downward (devalued) by the Tax Assessor's Office. The tax assessors are state-regulated professionals who are experienced in the valuation process. They use a variety of techniques (comparables, current replacement costs, etc.) to assign an approximate value. Their assessment of the parcel changes over time as the value of that particular parcel changes (square footage is increased if a room is added, for example) or values in an entire neighborhood undergo change (the impact of a significant disamenity such as a landfill, for example), and the value entered into the tax digest is adjusted accordingly. (Also, the owner may challenge the assessment and gain a reassessment.) Due to a combination of these factors, the assessed value of a parcel can be substantially different than the original value assigned when the property was initially purchased. The market value of the most recent arms-length transaction is only temporary. A property may change hands many times over years and each time this cycle of estimated value starts over.

The tax digest becomes the basis for the levying of taxes on all properties in the county. Each tax district prepares an annual budget. When the tax assessor's digest receives final review and approval from the State, it is turned over to the tax districts (including county government). The millage rate for the upcoming year must raise sufficient revenue from property owners to meet budgetary needs. In other words,

- the total amount required by the annual budget less any non-property-tax revenue sources = the amount to be raised from property taxes •

Once this amount is determined:

- the amount to be raised from property taxes = net taxable real property x the millage rate •

The millage rate is adjusted each year to provide adequate funds for the budget in each district.

Although the same tax digest is used by all taxing authorities, a customized digest is provided by the tax assessor for each district. The digest of properties used by Bostwick is not the same as the digest used by Rutledge, Madison or Buckhead. This is because individual tax districts collect taxes only from properties in their jurisdiction.

The county itself and the schools are an exception. They collect taxes from every property owner regardless of where the parcel is located. The county and schools together collect in excess of 85% of all property taxes each year. Therefore, any changes to the overall net aggregate real property tax digest affects the millage rates and revenues collected by the schools and county from every property owner. A widespread devaluation of property anywhere in the county affects the total taxes collected and therefore can affect the formula used to determine millage rates. If substantial reassessment occurs due to devaluation and tax revenues are projected to decline, tax districts have limited response options. They can cut their budgets, temporarily draw down reserve funds to cover their expenses, or increase revenues by raising millage rates (or reducing exemptions) for the upcoming year. All of these options affect every property owner in the county. If the cities also face a budget/revenue imbalance, their property owners are doubly affected because they will pay higher city taxes in addition to their higher school and county taxes.

To summarize, **no property owner or parcel is unaffected by the devaluation caused by a disamenity such as a landfill even if that parcel itself is not devalued.** The tax digest serves as the conduit through which devaluation spreads to every property owner in the county.

Estimated Tax Revenue Losses

Estimates of tax revenue losses are summarized in Figures 2 and 3, which show the impact of devaluation on properties within the five-mile landfill impact zone. Column 2 in the tables shows net real property taxable value after all adjustments have been made and exemptions have been removed. This is the amount used to calculate individual property taxes. For 2009, \$1,172,000,000 of value was adjusted first to \$786,500,000 (removal of exemptions, etc.) and then to \$314,400,000 (taxes are computed using 40% of net taxable value). The figures show the impact of estimated devaluation at several levels (%) including the dollar amount of revenue loss caused by the devaluation. Column 3 shows projected revenue loss at each % level, column 4 the total amount of loss in dollars and column 5 the millage rate increases that would be necessary to maintain current (2009) revenue from property taxes. Figure 2 shows the calculations for the county. Figure 3 shows the same calculations for the schools. Devaluation estimates are based on the 36% of net real property value in the county that falls within a five-mile radius of the proposed landfill site. No devaluation is assumed outside of that area, although some might occur. The lowest devaluation estimate (2%) is very conservative even compared with older, generally-accepted landfill studies. The highest estimate (15%) is still somewhat below the

highest hedonically-generated estimates for large landfills located adjacent to populated areas. This accurately describes the site proposed for the Morgan County landfill. Overall, this estimated range is reasonable.

The far-right-hand column should be of special interest to property owners outside of the five-mile radius from the landfill (see reference map at the end of this paper). It shows the increase in the 2009 millage rate that would be needed to compensate for losses due to devaluation inside the five-mile zone. Referring to Figure 2, if 5% devaluation caused a loss of \$128,560 for the county, the millage rate would have to be raised from 8.1780 to 8.300 to make up the difference. **This higher millage rate would apply to ALL parcels in the county, not just to those inside the five-mile radius.** The devaluation occurs in only part of the county, but taxes are raised throughout the county to compensate. Figure 3 shows projected millage rate increases for school system taxes.

Figure 2. Annual County Revenue Loss and Projected Millage Rate Increases Required by Net Aggregate Taxable Real Property Devaluation Within a Five-Mile Radius of the Proposed Landfill Site						
Estimated Devaluation	Aggregate Taxable Valuation Within 5-Mile Radius	Decrease in Taxable Property Value after Devaluation	Decrease in Revenue at 2009 Millage Rate of 8.1780	Millage Rate Required to Maintain 2009 Revenue Level		
Current	314,400,000	0	0	8.178		
2%	308,112,000	6,288,000	51,500	8.230		
5%	298,680,000	15,720,000	128,750	8.300		
10%	282,960,000	31,440,000	257,500	8.430		
15%	267,240,000	47,160,000	386,250	8.560		

Figure 3. Annual School Revenue Loss and Projected Millage Rate Increases Required by Net Aggregate Taxable Real Property Devaluation Within a Five-Mile Radius of the Proposed Landfill Site						
Estimated Devaluation	Aggregate Taxable Valuation Within 5-Mile Radius	Decrease in Taxable Property Value after Devaluation	Decrease in Revenue at 2009 Millage Rate of 12.461	Millage Rate Required to Maintain 2009 Revenue Level		
Current	314,400,000	0	0	12.461		
2%	308,112,000	6,288,000	78,350	12.540		
5%	298,680,000	15,720,000	195,900	12.660		
10%	282,960,000	31,440,000	392,000	12.850		
15%	267,240,000	47,160,000	587,700	13.050		

Figure 4 shows combined revenue losses from Figures 2 and 3. The far-right-hand column shows the total (in 2009 dollars) over the 30-year estimated life of the proposed landfill.

Figure 4. Combined Annual School and County Tax Revenue Losses at Varying Estimates of Aggregate Real Property Devaluation Within a Five-Mile Radius of the Proposed Landfill Site						
Estimated Devaluation	School	County	Annual Tax Revenue Loss	Total Over 30-Year Life of Proposed Landfill		
2%	78,350	51,500	129,850	3,895,500		
5%	195,900	128,750	324,650	9,739,500		
10%	392,000	257,500	649,500	19,485,000		
15%	587,700	386,250	973,950	29,218,500		

The City of Madison

Other potential revenue losses from devaluation are not included in the above Figures, the largest one being the City of Madison which had an aggregate net taxable property digest of \$295,000,000 in 2009. Most of Madison falls within the five-mile radius of the proposed landfill site (see reference map at the end of this paper). At a millage rate of 3.577 (excluding the lighting districts, which do not include all parcels in Madison) annual revenue loss would be \$21,000 at 2% devaluation, \$53,000 at 5%, \$105,500 at 10% and \$158,000 at 15%. Over a period of 30 years Madison losses at 10% would total \$6,300,000. This is the equivalent of one full year budget in 2009 dollars. Small additional amounts would be lost for properties included in the commercial and interstate lighting districts. According to the landfill application, Madison would receive no compensating financial from the landfill (see discussion of benefits section later in this paper).

Additional Landfill-Related Costs to Property Owners

Environmental Site Assessments

The possibility always exists of severe environmental degradation from landfill operations. Typical examples would include underground water pollution caused by a leaking cell liner or chemical or biological contamination escaping into surface water or the atmosphere and spreading to adjacent properties. This would further devalue properties, thereby adding to losses at time of sale. In addition, post-sale, the seller would remain exposed to legal action from the damaged buyer if complete disclosure of all potential disamenities had not occurred. There is a legal defense against this type of lawsuit known as an Environmental Site Assessment (ESA). This would be presented to the buyer prior to closing on the property. The buyer would have ample time to review the ESA prior to signing a purchase agreement, and an unfavorable report could either lead to further price negotiations or to a buyer decision not to purchase the property.

Normally ESA's are used only in large commercial transactions where the complexity and dollar amounts involved increase the potential for future litigation. In essence, an ESA is a form of insurance for the seller and provides protection against lawsuits over environmental issues that may emerge long after the sale (years or decades) but were not disclosed or otherwise detected at time of sale. An ESA is performed by a certified environmental professional, usually an engineering firm. They examine the property and surrounding area for potential environmental hazards and issue a written assessment that becomes part of the transaction (mortgage) documents when a property changes hands. ESA's are

conducted at Phase I and Phase II levels. Phase I involves on-site inspections (drainage, inflows from adjacent properties, etc.) but relies mostly on the review of existing databases (federal but also including State hazardous waste data, spill site records, etc.) and "standard environmental records, physical setting sources and historical use records." Minimum required range of a data search is one mile. How much further out it goes depends upon local factors (known issues, topography, etc.). Phase II involves direct on-site testing for hazardous chemicals and materials (including underground storage tanks, and leakage of chemicals, etc.). Phase II is usually undertaken when data from Phase I uncovers problems that require further clarification as to type, source, etc. Phase II can also be requested by the buyer regardless of whether or not the seller feels it is necessary. This becomes another negotiated issue between seller and buyer. The cost of an ESA is negotiable with the engineering firm. There can also be negotiations between seller and buyer over who bears the cost. Phase I prices typically start at \$2,000. Vacant land would be lower, commercial properties higher. The cost of a Phase II study is harder to estimate in advance because the engineers do not know what they will find once they start testing. An average price would be in the range of \$5,000 for a small commercial or residential property.

An ESA generally works to the advantage of the seller of the property. As soon as there is even a rumor of an environmental problem associated with the landfill (leakage, rodent sitings, escaping gasses, underground water contamination, alleged health issues, etc.) the seller is exposed to potential lawsuits and would want protection against liability claims. Sellers of more expensive homes or of commercial properties or tracts of vacant land (where future development might involve multiple owners because of subdividing) would be most likely to want this type of protection.

There are 3,690 properties within a five-mile radius of the proposed Morgan County landfill site, including 128 within one mile, an additional 426 between one and two miles and 3100 between two and five miles. If 100% of those within one mile, 75% of those within one-to-two miles and 30% of those between two and five miles opted to have a Phase I ESA performed prior to selling their property, and assuming all were completed at the minimal \$2,000 price (*i.e.*, no Phase II studies), the total cost to landowners would be \$2,756,000. If 50% of properties within a one-mile radius getting a Phase I assessment also required a Phase II ESA, the additional cost (over the cost of Phase I) would be \$192,000. If only 30% of properties between one and two miles required a Phase II study, the added cost would be \$288,000. And if 10% of properties between two and five miles upgraded from Phase I to Phase II the added costs would be \$279,000. Adding these Phase II totals to Phase I figures would raise the ESA total for all landowners within the five-mile radius to \$3,515,000. **The biggest cost, however, might be intangible, stemming from the fact that the seller was protecting himself with an ESA.** This could easily arouse the buyer's suspicion about potential environmental risks associated with the property and dampen enthusiasm for the purchase. This would create downward price pressure and strengthen the buyer's hand when it came to price negotiations. It might even cause the buyer to walk away. A seller who did not perform an ESA would be exposed to future risk of litigation.

The Long-Term Risks of Total Devaluation

The possibility of severe environmental degradation from landfill operations raises another long-term risk for property owners, that being the potential for a total collapse of property value. Some negative effects of landfills become apparent only after many years of operation. Water or other underground pollution and/or health hazards are examples. This may initially only be suspected due to incidences of illness allegedly caused by contamination. But if they are confirmed by environmental or epidemiological studies, property values in the area plunge immediately. **In a worst-case scenario, the**

value of properties that are considered too contaminated for human habitation (or agricultural activities in a rural area) can plummet to near-zero (the property becomes unsellable at any price).

Part of the devaluation that occurs when a landfill is first sited takes into consideration the possibility that something could go wrong in later years. But if something actually does go wrong, the value of a property undergoes a second round of devaluation, this one fueled by strong (even irrational) feelings on the part of potential buyers that this is an undesirable area in which to live or work.

Summary of Devaluation and Tax Revenue Losses

Based on a wide variety of landfill studies going back to the early 1990's, there is a near-unanimous consensus among experts that the presence of a landfill causes devaluation of the fair market value of properties. The larger the landfill the greater the probability of significant devaluation, especially if it is located in close proximity to a populated area. This devaluation impacts an area out to at least a five-mile radius from the landfill with some studies measuring devaluation out to a seven-mile radius. More recent studies, which are based on hedonic valuation models, suggest greater estimated devaluation out to five miles than earlier studies based on comparables and mostly limited to a two-mile radius.

Regarding fair market value, a conservative estimate of average property devaluation of 5% of the 2009 fair market value in a five-mile radius from the proposed landfill site would cost Morgan County landowners \$58,600,000. A 10% devaluation over the same area would cost property owners \$117,200,000.

Fair market devaluation will vary on a per-parcel basis depending upon the distance from the landfill and will be realized (in economic terms) only when each individual parcel is sold. The losses are nonetheless real. Based on an industry-standard average residential property turnover rate of seven years, almost all of the residential portion of these property value losses would occur during the first 25% of the life expectancy of the landfill.

Devaluation will also result in a reduction in property tax revenues for the schools, the county and the City of Madison. Although the fair market assessment reductions that occur may be limited to properties within a five-mile radius, they will affect the aggregate net taxable property value for the entire county. This will cause a reduction in revenues to the county's largest tax districts *i.e.*, the schools and the county, who rely on taxes from all property owners to meet their annual budgets. Revenue shortfalls due to devaluation in a five-mile radius would be compensated for by tax increases applied to all properties in the county. Using a conservative 5% average devaluation of taxable value within a five-mile radius and using 2009 millage rates and the 2009 net real property tax digest for these three tax districts, the estimated reductions in revenues for the schools and the county would total \$324,650 annually and \$9,739,500 over the life of the landfill. A 10% devaluation within the five-mile radius would cost the schools and the county \$649,500 annually and \$19,485,000 over the life of the landfill. City of Madison losses at 5% would be \$53,000 annually (\$1,590,000 over the life of the landfill) and at 10% \$105,000 annually (\$3,150,000 over the life of the landfill).

The total of all losses to all tax districts affected over the projected life of the landfill would be \$11,329,500 at 5% and \$22,635,000 at 10%. If tax increases were enacted to compensate for these losses, they would apply to all taxpayers in the county, not just to those directly affected by landfill devaluation.

In addition, there would be significant costs to property owners caused by the long-term risks of a catastrophic environmental or human health event impacting residents in areas surrounding the landfill. Environmental Site Assessments (ESA) conducted by engineering firms for property owners at time of sale are recognized by the courts as a defensive measure against future liability claims made by buyers alleging improper disclosure of potential environmental disamenities affecting a property. A reasonable estimate of the number of property owners within a five-mile radius who would decide to have an ESA conducted (or would be required to by potential buyers) would cost an estimated \$3,515,000 for assessments on those properties. This would be in addition to all other fair market values losses taken by property owners.

From the perspective of long-term risk assessment, a catastrophic environmental event could reduce the fair market value of a parcel to near-zero (the property could not be sold at any price). In this circumstance, the property owner would lose 100% of fair market value and the tax districts would lose 100% of annual revenue from that parcel because the assessment would be reduced to near-zero. Both the property owner and the tax districts affected would experience total loss. Taxpayers in other areas of the county would have to make up the difference through higher taxes.

III. THE IMPACT OF A LANDFILL ON LOCAL WASTE HANDLING COSTS AND REVENUES

Based on studies of landfills throughout the country, a review of the recent Morgan County Solid Waste and Recycling budget, and representations made in the landfill application, it seems probable that county government would derive financial benefits from a local landfill. These would be a combination of reduced MSW handling expenses and hosting fees paid to the county by the landfill operator.

Data points:

1. In 2009 the county spent \$1,117,000 on “solid waste and recycling.”
2. Approximately \$329,000 in revenue was received from “refuse collection charges” and other fees paid to the county by local commercial MSW handlers and others.
2. Because revenues from waste refuse collection charges fell short of total costs, \$878,000 was transferred to the solid waste budget from the county General Fund. This represents 4.6% of total county expenditures for Fiscal Year 2009. (2008 figures: \$940,000, or 5.0% of total county expenditures.)

A landfill within the county would create opportunities to reduce these General Fund transfers by reducing waste handling costs and increasing revenues from hosting fees paid by the landfill operator.

Current Municipal Solid Waste Handling Procedures.

The way MSW is currently handled in the county establishes parameters for benefits that might result from opening a local landfill. A brief explanation of MSW flow serves as a starting point.

Household waste is either taken to one of several dumpsters/compactors placed throughout the county or left curbside for pickup by a commercial MSW contractor or by the City of Madison. Most business-generated waste is also collected by private contractors. All MSW (except some recyclables) is taken to

the county transfer station where it is then transported by a private hauler to a landfill in Barrow County. Recycled materials not taken to the transfer station include cardboard/paper and plastic/metal/glass containers which are sold and shipped directly to a recycler in Athens. Some types of recyclable materials, scrap metal being the most important, are taken to the transfer station for sorting before being sold to a recycler.

Data points:

1. The county has the equivalent of 9 full-time employees handling waste (combination of full and part-time).
2. The county handled approximately 15,500 tons of MSW in 2009. Slightly more than 50% came from private waste collection services, slightly less than 50% from City of Madison and county collections.
3. The county charges businesses and commercial waste removal companies for waste brought to the transfer station. This revenue, which totaled approximately \$329,000 in 2009, covers the costs of processing the waste at the transfer station and also the costs of paying the hauler to take the MSW to the landfill. This revenue somewhat exceeds the actual landfill transport and disposal costs (by an estimated \$40,000 in 2009) and helps to offset the operational costs of the transfer station.
4. The county currently pays a private hauler \$33.75 per ton which includes both transportation costs and disposal (tipping) fees paid to the Barrow County landfill. Total 2009 costs to the county for these services were approximately \$525,000.
5. The county received approximately \$24,000 in revenue for recycled materials in 2009, approximately two-thirds from recycled scrap metals handled at the transfer station.

Cost Reduction Opportunities.

Based on current MSW flow and current handling procedures, potential areas of cost reduction include:

1. **Closing the county waste transfer station.** Because MSW could be transported directly to the landfill, it is possible that the county transfer station would no longer be needed. Considerable savings could be gained by closing the facility, terminating two full-time employees plus additional part-time labor, etc. The audited Solid Waste and Recycling budget does not identify expenses solely attributable to transfer station operation. A reasonable estimate of savings from a complete shutdown would be approximately \$150,000 (including labor). However, the county would lose its ability to process waste from private contractors (commercial firms, etc.) and therefore would forfeit a revenue stream from third-party waste handling charges in the amount of \$329,000 (for 2009) from which it realizes approximately \$40,000 in "profit." The county might also forfeit revenues from recycled scrap metals unless alternate collection and handling arrangements were made. Therefore, a more realistic estimate of net savings from the closing of the transfer station would be \$110,000 per year.

2. **Reduced MSW transportation costs.** County employees currently haul waste from the dumpster/compactors to the county transfer station. Waste is then transported by a contract hauler from the transfer station to a landfill in Barrow County. This requires a round trip of 85 miles, the cost of which is included in the \$33.75 per ton fee paid by the county. The proposed landfill would be located one mile south of Madison. Local waste could be taken directly to the landfill, not only bypassing the transfer station but also eliminating the round trip to Barrow County. Local disposal could yield savings in transportation costs (less mileage, less wear on vehicles, better productivity of labor, etc.). This would

presumably be reflected in reductions in the transportation portion of fees paid to haulers. However, it is less likely that using county employees to transport waste to a local landfill instead of to the local transfer station would result in significant savings because there would be little reduction in mileage. Determining whether it would be less expensive to transport waste to a local landfill by a contract hauler or by county employees would be necessary before transportation cost reduction estimates could be finalized.

The county's existing contract with a commercial hauler does not isolate transportation costs from tipping fees. A mileage-based estimate of transport cost of \$10.00± per ton (\$240.00 per load) can be used for direct hauling of the portion of MSW to Barrow County for which the county is not being compensated for by third parties (commercial accounts, etc.). However, waste transport involves substantial fixed costs (vehicles, labor) and transport costs for local disposal would not decrease proportionally to a decrease in mileage. A contract hauler might switch from long-haul trucks (20+ tons per load) to local, short-haul trucks (10± tons per load) which could reduce their fixed costs. Many landfills charge higher tipping fees to smaller trucks carrying local loads (as well as to cash customers) due to higher per ton handling costs at the landfill. A larger number of smaller trucks entering the landfill also increases processing time at the landfill for haulers (both private and county), thereby increasing waiting time and per-ton labor and equipment costs. If the transport cost per ton charged by a private hauler could be reduced by 50% due to the proximity of a local landfill, savings would be \$35,000 per year. As previously noted, calculations would have to be undertaken to determine whether or not using county employees would be more or less cost-effective.

3. **Reduced county payroll expense.** Payroll expenses represented 35% of the total county waste disposal budget in 2009. As already noted, closing the transfer station would eliminate personnel (2+ full-time employee equivalents). Proximity to the landfill might also allow further reductions in personnel and related expenses for county MSW handling and hauling activities. For example, if a private company were contracted to haul waste from local dumpsters to the local landfill, fewer county employees would be needed. Because personnel expenses are not separated by actual job description within the overall Solid Waste and Recycling budget, payroll cost reductions possible for non-transfer station employees can only be estimated. On a per-person basis these appear to be approximately \$43,700, including fringe benefits, overtime, etc. If local hauling by a private contractor allowed a manpower reduction of the remaining seven employees, the county would save \$306,000 per year. This sounds like a substantial savings opportunity but the local private hauler would have to be paid (per ton or per mile) for services and these costs would eliminate most if not all of the savings from a private hauler. Estimates of local service costs from private haulers are not available at this time. Savings from a private hauler totaling 10% of current county payroll costs would be \$31,000.

Anecdotally, proponents of the landfill have introduced the possibility that the new landfill operator would haul MSW from the compactor sites throughout the county to the new landfill at no cost to the county. This would allow the county to terminate the 7 employees assigned to this as their primary function. It would also allow the county to further reduce local transportation costs including mileage costs, the costs of vehicle maintenance, etc. It has been suggested that this could save the county in excess of \$306,000 in payroll plus other costs. However, there is no mention of this "free" service in the applicant's proposed benefits to the county and for that reason is not considered even in a best-case scenario of potential savings.

4. **Reduced tipping fees.** Tipping fees paid to landfill owner-operators for waste disposal are a major part of the county's waste handling costs. Overall disposal fees were \$525,000± in 2009. This

constitutes 47% of the total Morgan County waste handling expenditures in 2009, up from 43.8% in 2008. Typical concessions by landfill operators to host governing entities include discounts on tipping fees for local waste. These discounts could reduce county tipping fee expenditures. However, the Morgan County application does not offer either discounts on tipping fees or any other discounts on handling or transportation costs. These might or might not be negotiated at some future point. A 10% reduction in tipping fees (based on current rates being paid to Barrow County) would save the county \$17,000± on the portion of the MSW handled by the county itself (i.e., excluding waste handled by commercial collectors). A 25% discount would yield \$42,500. This would be in addition to savings from closing the transfer station (Item 1, above) and any transportation cost and payroll reductions (Items 2 and 3, above). Because no discounts have been offered or negotiated, tipping fee savings are included only in the best-case (most optimistic) benefit scenario.

Summary of Cost Reduction Opportunities.

If the transfer station were closed and all optimum cost reductions realized as per the above estimates, the total annual cost savings to the county could be as much as \$216,000. A 25% discount on tipping fees negotiated with the local landfill would increase savings by an additional \$42,000 to \$258,000. However, closing the transfer station would reduce revenues by a net of \$40,000. Therefore, **estimated net cost reduction (best case) would be \$218,000 annually.**

If the transfer station remained open, savings would come from eliminating the round trip to Barrow County for an estimated savings of \$35,000 annually. In this scenario there would be no discount on tipping fees negotiated with the local landfill. However, the \$40,000 in excess revenues currently being generated by the transfer station would likely be lost, the assumption being that local commercial and City of Madison waste haulers would opt to take waste directly to the local landfill instead of the county transfer station. **Therefore, estimated net cost reduction (less-than-best-case) could be as little as zero, i.e., no savings at all.**

Revenue Opportunities.

The siting of a regional solid waste landfill within the county could create new revenue opportunities for county government. These could have a positive impact on the county budget once the landfill was operating at maximum capacity.

Data points:

1. Applicant estimate of landfill capacity when fully operational: 1000-1200 tons per day.
2. Applicant estimate of landfill operating days: 286 per year.
3. Average landfill hosting fees nationally \$2.00 - \$2.50 per ton.
4. Average hosting fees at Middle Georgia landfills: \$1.28 per ton (2009) increasing to an estimated \$1.45 (by 2013).
5. Applicant estimate of hosting fees over life of landfill: \$20,000,000 - \$30,000,000.
6. Applicant estimate of additional property taxes paid annually over life of landfill: \$80,000.

Additional revenue opportunities from a new landfill could include:

1. **Hosting fees paid by landfill owners/operators.** Counties are entitled to receive a payment (referred to as hosting fees) for each ton of MSW deposited into a landfill in their jurisdiction. The State

of Georgia mandates a minimum of \$1.00 per ton to the host county. Hosting fees across the country typically range as high as \$2.50 per ton. However, less expensive land and greater competition between landfill operators have made it difficult for landfill operators to charge high fees (referred to as tipping fees) to their customers. Tipping fees in Georgia are well below national averages, a trend that is projected to continue as new disposal options come on-line. Low tipping fees result in low hosting fees paid to counties (hosting fees in Georgia are also below the national average). Estimated handling capacity of the proposed landfill when fully-operational would be approximately 1200 tons per day, 343,000 tons annually working a 5 ½ day week. Maximum average estimated tonnage (1200) paying above-average hosting fees (\$2.00 per ton) would generate \$686,000 in hosting fees annually and \$20,580,000 over the life of the project. At a lower average tonnage (800 per day) and a more realistic (for Georgia) rate of \$1.50 per ton, a less optimistic estimate of annual revenues would be \$343,000 (\$10,290,000 over the life of the project). Income would be erratic because actual disposal tonnage at landfills varies considerably over time depending upon overall economic activity, competitive pressures from other landfills, etc. Payments made to the county would fluctuate accordingly.

The landfill application also indicates that construction and demolition (C & D) waste would be accepted. C & D disposal also generates tipping fees but is not co-mingled with MSW and pays fees at a rate of only half to two-thirds that of MSW. Nonetheless, C & D would add to the overall hosting fees received by the county. It is not clear from the application if C & D is included in their tonnage estimates or, since C & D disposal would not be available immediately upon startup, if this would provide hosting fee revenues in addition to those cited above but only at a later date. If C & D is included in the 1200 ton per-day estimate, however, average per-ton tipping fees and total revenues for the county would be lower.

2. Increased Real Property Tax Revenues from the Landfill Site. The 518 acre tract in question is currently zoned AR and valued at approximately \$5,500 per acre. However, the parcel is in the Conservation Use Valuation Assessment (CUVA) program so that the amount of property taxes paid (the benefits from which affect only the county and schools because of where the parcel is located) is reduced. If the zoning were to be changed to I-2 as the applicant is requesting, eligibility for CUVA would be lost and tax payments would increase even if the land remained vacant. Exact timing of any zoning change would have a significant effect on property tax payments going forward because the assessment would increase immediately. However, as per the standard 10-year CUVA agreement, the property owner would be required to pay back taxes (at the non-CUVA assessment rate) plus penalties and interest when the parcel was removed from the CUVA program. The aggregate total of these payments would increase each year that removal from CUVA was delayed. Based on a three-year delay (starting from 2010) estimated back taxes and penalties plus interest could be as high as \$200,000. This would represent a one-time windfall payment to county government.

Once the landfill was operational, the property would be reassessed upward gradually to reflect the altered land use. The courts have ruled that actual assessments of landfills cannot be based on the factors the assessor normally uses (comparisons with adjacent properties, for example) but instead are based on annual income from landfill activities. The applicant estimates that “new annual property taxes” would total approximately \$80,000 per year based on their estimate of 1200 tons per day. It is important to understand that property taxes would be paid by the landfill on a varying rate without any guaranteed minimums. First of all, property taxes would phase in over a period of years as the waste volume handling increased and assessments were adjusted upward accordingly. Secondly, if waste handling decreased (due to economic conditions, competitive pressures that diverted waste to other landfills, tipping fee discounts, etc.), incomes could fall and the landfill operator could request the

assessment be lowered, thereby reducing taxes. If tonnage fell to an average of 800 per day, income (and therefore property assessment) would drop and property taxes would decline to an average of \$53,000 per year. Many fluctuations in business levels could reasonably be expected over a 30-year period, so that there is no way to accurately estimate actual average property tax payments over this period.

Another point to be considered regarding property taxes: once the landfill is closed, income will likely drop to zero thereby decreasing property assessments to near-zero. Waste mining and/or methane capture are possible even after the landfill was closed and these could generate income for the property owner. But the property would remain zoned I-2 and there is no other normal industrial use possible for the land for decades. From the standpoint of the assessor, unless some kind of activity continued to generate income from the property, the property would be worthless and would have to be assessed accordingly. Tax revenues from the parcel would be near-zero for an extended period of time, partially or completely offsetting any gains that occurred during the operational years.

3. **Monitoring fees.** Landfill operations are highly regulated by Federal statute (referred to collectively as EPA "Subtitle D Regulations"). However, local ordinances can also apply both to the landfill itself and to the transport vehicles and the mitigation procedures used to shield county residents from possible health, pollution or other hazards or disamenities such as noise, dust, light and sound pollution, etc. Counties typically receive payments from landfill owners/operators and from transport companies for the monitoring and inspection of landfill operations occurring in their jurisdiction. No estimate of these potential payments is possible at this time.

Summary of Revenue Opportunities.

If MSW handling occurs at an average volume of 1200 tons and an above-average (for Georgia) hosting fee of \$2.00 per ton could be negotiated, hosting fee revenues could be as high as \$686,000 per year. Added to that would be \$80,000 in property tax payments (applicant's estimate) for a **best-case revenue projection of \$766,000.**

A lower average of 800 tons per day (which would allow for normal fluctuations in volume) and a \$1.50 per ton hosting fee (about the expected average for Middle Georgia over the next several years) would yield \$343,000 per year. Added to that would be a lower estimated assessment of \$53,000 (because of a lower average annual tonnage). **The less-than-best-case revenue projections would total \$396,000 per year.**

In addition, it is possible that in either scenario that monitoring fees would offset additional government services provided to the landfill site (police, fire, minor but not major costs for roads and bridges, etc.) although there is no way to estimate these fees at this time.

In either scenario there could be a **one-time payment of approximately \$200,000** in back taxes, penalties and interest when the property was removed from CUVA.

Summary of Total Benefits (Cost Reduction) and Revenue Opportunities

Because benefits can only be estimated at this time, a range must be used to assess impact. We can determine a best-case and less-than-best-case estimate (from the standpoint of the county). There could be several possible combinations of savings and revenues lower than best-case but higher than less-than-best which would provide total benefits somewhere between the two extremes. The summary below provides only parameters, not exact estimates.

1. **Best-case scenario**. This would include closing the transfer station. It would also include significant reductions in waste transportation costs (whether by contract or county employees) and a substantial discount in county tipping fee costs. Best-case projections of potential benefits would also assume maximum fees paid by the owner/operator based on consistently high levels of tonnage deposits and above-average hosting fees over the projected life of the landfill. A high volume landfill would pay consistently high property taxes to the county and schools.

Total benefits to county government in a best-case scenario would be \$984,000 annually plus a possible one-time payment of approximately \$200,000.

2. **Less-than-best-case scenario**. This would include the continued operation of the transfer station requiring retention of at least some county employees. All commercial waste currently handled by the transfer station would be lost to the landfill, however, thereby eliminating the current \$40,000 annual net income from handling charges. Less-than-best would assume minimal reductions in waste transportation costs (whether by county employees or private hauler) and no discounts in tipping fee payments by the county to the landfill owner/operator. Benefit projections would also assume a lower rate for hosting fees paid to the county (perhaps only the current Middle Georgia average of \$1.50 per ton) and low and perhaps also inconsistent levels of tonnage deposits over the life of the landfill averaging only 800 per day. There also might be little or no additional fees paid to the county for the monitoring and inspection of the landfill site. Lastly, less-than-best assumes little or no change in recycling, which would require not only continued tipping fee payments for otherwise recyclable waste but would also result in no increase in payments to the county from recyclers.

Total benefits to county government in a less-than-best-case scenario would be \$396,000 annually plus a possible one-time payment of approximately \$200,000.

IV. CONCLUSION.

If a regional landfill is sited as proposed, there is ample evidence to indicate that the negative economic effects on property owners and taxpayers (real property devaluation leading to increased millage rates) would far exceed benefits (hosting fee revenues and MSW operational cost savings) over the expected life of the landfill. Worse, there would be an imbalance in the distribution of benefits and costs among county residents and governing authorities. County government would receive virtually all of the benefits, property owners within a five-mile radius of the landfill site would incur most of the real property losses, and property owners outside of the five-mile radius would pay most of the tax increases required to balance budgets.

A best-case estimate of likely total benefits is slightly less than \$1,000,000 per year or \$30,000,000 over the life of the landfill. (The applicant estimates revenues of \$20-30M in hosting fees plus an additional \$2.4 in property taxes over the same period.) By comparison, the most conservative estimate of fair market property devaluation (2% of the 2009 fair market value in a five-mile radius from the proposed landfill site) would cost landowners (65% of whom are residential) a total of \$23,440,000 with Environmental Site Assessments adding another \$3,000,000±. In addition to this, the total loss in property tax revenues over the same 30-year span would be \$3,895,500 bringing total costs at the lowest estimated level of devaluation to \$30,335,500. When devaluation estimates are increased to a slightly more aggressive estimate of 5%, combined losses total \$71,339,500. **At 10% devaluation, a plausible estimate given the size and location of the landfill, the combined fair market value and property tax losses would be what for Morgan County is an astronomical sum - \$139,679,000.** This would be an average loss of \$4,500,000 each year for 30 consecutive years (vs. slightly more than \$1,000,000 in annual benefits per the applicant's estimates) with most of the fair market devaluation costs coming in the first seven years of landfill operation. Even in a best-case scenario, the 10% devaluation level, county residents would lose \$4.00 for every \$1.00 in benefits paid by the landfill operator over the life of the project.

The applicant has justified the request for a zoning variance leading to the siting of a landfill in Morgan County largely in economic terms, i.e., financial benefits to county government, the school system and taxpayers. The reality is, however, that from the standpoint of economic impact, **the landfill will inflict substantial financial losses on taxpayers and property owners throughout the county.** For that reason the applicant request for a zoning variance to permit a landfill should be denied.

APPENDIX: ECONOMIC ISSUES NOT CONSIDERED IN THIS PAPER

There are potentially significant economic issues not discussed in this paper. What follows is a brief list with an explanation as to why they were excluded at this time.

1. Infrastructure Maintenance and Community Services Costs. There could be an increase in infrastructure maintenance costs due primarily to an increase in heavy truck traffic carrying MSW to the landfill site. City of Madison and county roads and bridges would be affected. There could also be additional miscellaneous expenses for health and safety compliance monitoring, roadside cleanup of windblown trash and liquid spills from long-haul trucks along main transportation routes, etc. The landfill application does not mention or offer to reimburse the county or City of Madison for these costs.

In 2008 Prof. Jeffrey Dorfmann prepared a study for the Morgan County Board of Commissioners which analyzed the costs of various types of services which are provided by local government. This study dealt with the costs of community services in general terms and did not address the specific costs associated with a landfill. But the study arrived at estimates of costs that would serve as a useful starting point for determining new local government expenditures that might be necessitated by the proposed landfill. See Jeffrey H. Dorfmann, The Local Government Fiscal Impacts of Land Uses in Morgan County: Revenue and Expenditure Streams By Land Use Category, (June 2008) http://www.mmcgeorgia.org/file_download/5.

At this time there is insufficient information available to address the potential impact of landfill-related community service costs and so this has not been included in this paper.

2. Lost Sales Tax Revenues. Morgan County, the school system and the City of Madison rely on sales tax revenues to meet their budgetary needs. Much of this revenue is generated by tourism, an important part of the local economy especially in the City of Madison's Historic District. If the landfill were to cause a decline in tourism, the revenue losses would be felt in all major tax districts in the county. For example, in 2009 the Local Option Sales Tax (LOST) generated approximately \$1,370,000 in revenues for the county in addition to hotel/motel and beer and wine tax revenues. Special Local Option Sales Tax (SPLOST) revenues are being counted on to collect \$19,500,000 for bond payments on the Morgan County Detention Center. The school system hopes to collect as much as \$30,000,000 from the current Education Local Option Sales Tax (ELOST IV) over the next several years. This money is earmarked for the construction of a new middle school in Rutledge. The loss of part of these revenues due to a decline in local purchases by residents or tourists would cause budgetary problems and increase the incentive to raise property taxes to compensate.

Currently there are no available national or local studies or estimates available on the impact of a landfill on tourism or sales tax revenues. For that reason this subject is not addressed in this paper.

3. Potential Health-Related Costs. If a catastrophic event were to occur at the landfill (release of toxic gasses or environmental degradation of surface or underground water, as examples), serious health effects could result. Like many other landfill effects, those closest to the landfill would likely be affected first. But, in a worst-case scenario, water flows could carry pathogens or toxins many miles from the landfill site. Such effects would be costly to local residents and businesses, which would have to rely on

their personal or business health insurance, Medicare or Medicaid or their personal savings to pay the bills. A recent (2009) study indicates that of the 1,500,000 Americans who declared personal bankruptcy that year 60% did so because of a catastrophic health event impacting either themselves or someone in their immediate family. It is unlikely, however, that community-wide health-related costs associated with a landfill would be reimbursed by the landfill owner/operator. Nor would they impact local government budgets. For that reason these potential costs have not been considered in this paper.

4. Loss of Tax Revenues and Jobs near the Landfill Site. Business and industrial growth in Morgan County has been trending toward the area south of the City of Madison. This is where the applicant proposes to locate the landfill. This raises several questions. First, will other businesses be discouraged by the presence of a landfill and decide to locate elsewhere, thereby depriving Morgan County of tax revenues and jobs, or will the landfill attract other industries to the area? Second, would the landfill site itself (518 acres) produce more economic benefits for the county if it were used for some other industrial purpose (light or heavy manufacturing, for example) or even for some other method of MSW processing (incineration or plasma arc disposal, as examples)? (The landfill applicant has stated that efforts to find other, higher uses for the property have not produced acceptable results.)

While it could be argued that these factors should be considered as part of an overall economic analysis of the landfill impact, no local studies have been conducted that provide data or even reasonable estimates of potential gains or losses. Without these, comments in this paper would be highly speculative and lacking in credibility. Therefore, these questions are not addressed.

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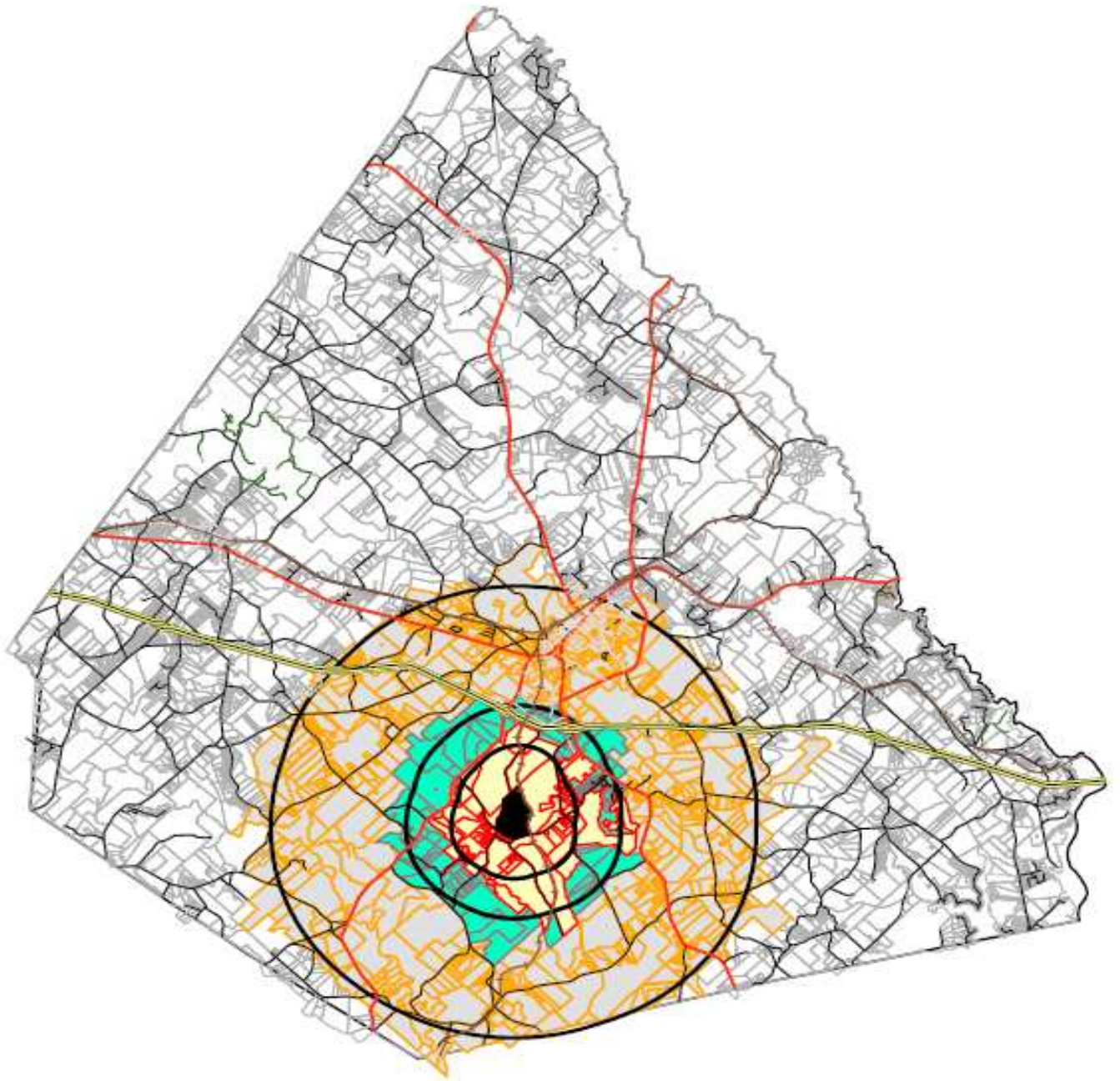
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The opinions expressed in this paper are those of Mr. Blanchard who remains responsible for any errors, omissions or misjudgments. Updates and corrections will be posted online only in a printable/searchable file at www.reprodox.net/rb/mclandfill.pdf. Check the version number on the cover sheet to make sure you have the latest update.

Please remember to recycle.



Map of Morgan County showing the proposed site of 518 acre landfill with impact zone bands outlined at a one-, two- and five-mile radius.