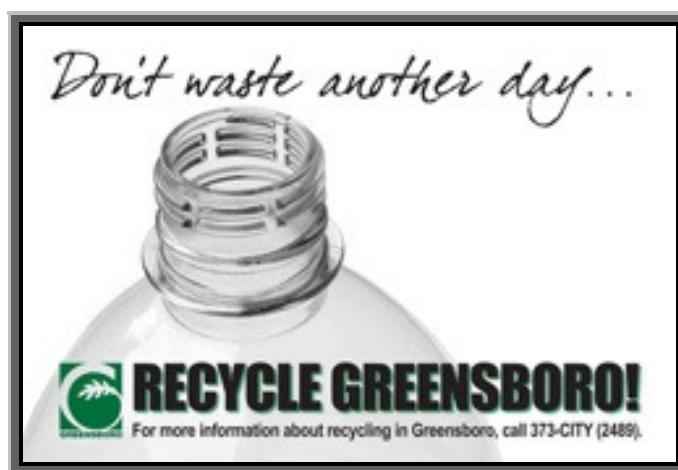


FINAL REPORT

WASTE MANAGEMENT AND RECYCLING TASK FORCE CITY OF GREENSBORO, NC

October 31, 2012



The citizen-driven Waste Management and Recycling Task Force was created in February 2012 by the Greensboro City Council to review the City's current and long-term waste management and recycling practices.

**FINAL REPORT OF THE WASTE MANAGEMENT AND RECYCLING TASK FORCE
CITY OF GREENSBORO, NC**

OCTOBER 31, 2012

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CITY OF GREENSBORO, NC**

OCTOBER 31, 2012

EXECUTIVE SUMMARY

Background

On February 21, 2012, Greensboro City Council passed a resolution to create a Waste Management and Recycling Task Force. The Task Force was charged with reviewing and developing recommendations for long-term, sustainable waste management, waste reduction and recycling options.

Focus

During its tenure, the 9-member Task Force focused on strategies to: 1) reduce the cost of Municipal Solid Waste (MSW) disposal to the City, 2) encourage regional cooperation, and 3) pursue a reduction in reliance on land filling, especially land filling of bulk, unprocessed municipal solid waste, while minimizing impacts on human health, economic development and the environment.

Guiding Principles

We believe that certain *guiding principles* should be followed in the pursuit of progress toward those goals:

1. Regional partners will only work together if there are clear advantages to doing so, i.e., when there is a Win-Win outcome, with no real or perceived losers.
2. Never be the first public entity in the U.S. to employ new technology at an operational scale; let others do the beta testing. Pilot-scale projects with shared risk may be OK.
3. When new (or even old) technology is employed, do so in a modular or scalable fashion. This means to commit only a portion of the waste stream to any one method of treatment or disposal. (Most waste processing technologies are scalable, where a single unit is designed to process a fixed amount, say 100 or 200 tons per day.) This is a technical way of saying “don’t put all your eggs in one basket”. This way, capital expenditures (and risk) can be limited and, depending on successes and failures in practice and evolving regulations and cost variables, adjustments can be made to increase or reduce reliance on any one disposal method. The result is a spreading of risk over multiple solutions, thus reducing the overall risk of failure.
4. Any technology pursued seriously should be subject to intense scrutiny by solid waste professionals, including scientific scrutiny in peer-reviewed journals. It should also be carefully studied with regard to its impacts on human health, economic development and the environment. (See reference 2)

5. Given the current waste management paradigm (described in the MSW Disposal Subcommittee Report that follows) and the limited nature of this task force's capabilities, we have adopted and recommend a paradigm shift in long-term planning for Greensboro's waste disposal. Scientific innovation has historically taken long periods of time filled with failures and adaptations (i.e., trial and error). This seems to hold true in MSW management in the U.S. despite efforts by many entrepreneurs to develop the next great MSW solution, i.e., the "silver bullet". The recommended shift then is away from the search for a silver bullet and toward a strategy that emphasizes deliberate and steady progress, sustainability of purpose, and positioning for the evolution of MSW waste management into the post-landfill era (the longer long-term). A 10-year planning window seems appropriate for this purpose.

Research

The Task Force researched current methods of handling MSW in the U.S. and in Greensboro; best disposal practices in North Carolina; MSW recycling and reduction; landfill gas-to-energy; and "next generation" methods of disposal, including Waste-to-Energy (WtE) and waste conversion strategies.

Recommendations

MSW Disposal Strategies

- *Strategy 1:* Begin study of, and eventually planning for, a MSW facility owned and operated by the City of Greensboro that will process MSW for volume reduction and other benefits (renewable fuels, waste-to-energy feedstocks, etc.), preferably one that will attract neighboring communities to utilize it with consideration for disposal of residue at their MSW landfill.
- *Strategy 2:* Monitor advancements and/or alternative strategies and technologies in MSW disposal being utilized by other governments in NC.
- *Strategy 3:* Explore the feasibility of regional collaboration in solid waste disposal considering, among other things, potential mandated environmental and health regulations, advanced technology, required infrastructure, and fiscal parameters. Consider public regional landfilling options, preferably as an equity partner (e.g., Randolph County, Rockingham County).
- *Strategy 4:* Explore the benefits of a regional administrative structure in the form of a waste management authority to serve as the managing body for future disposal of solid waste.
- *Strategy 5:* Explore the feasibility of waste transport by rail as an alternative to trucking, assuming that the current MSW transfer strategy endures for the next 20+ years (rail transport is not believed to be feasible in the 10-year planning period due to a lack of industry infrastructure in NC).

MSW Recycling & Reduction Strategies

- *Strategy 1:* Ensure that multi-family units are incorporated into the city's curbside recycling routes where possible and that public housing units are included in curbside recycling.

- *Strategy 2:* Implement a pilot program using routing and Radio Frequency Identification Technology (RFID) to optimize route efficiency, measure program performance and track program participation.
- *Strategy 3:* Encourage the *reduction* of waste requiring disposal by a) expanding the types of materials that can be accepted and processed at the recycling facility, b) promoting the practice of backyard composting, c) encouraging large commercial generators of food waste to divert organic materials from the waste stream, and d) supporting outside proposals/programs that offer services for recycling special wastes.

Landfill Gas-to-Energy Strategies

- *Strategy 1:* Issue a Request for Qualifications (RFQ) to outside vendors to explore and propose ways in which the White Street Landfill's excess methane could safely become a source of positive net revenue for the City, without adversely impacting the surrounding neighborhood.

Looking Ahead

The Task Force recommends continued citizen involvement through the formation of a City commission to provide City Council and staff with public input, technical research, and strategic planning on issues concerning all aspects of waste management and disposal. In addition, research is needed to determine the need for and benefit of a regional concept and collaboration with regional partners.

TASK FORCE BACKGROUND

On February 21, 2012, the Greensboro City Council passed a resolution to form a Waste Management and Recycling Task Force. The Task Force was charged with reviewing and developing recommendations for long-term waste management, waste reduction, and recycling practices.

The Task Force consists of the following people, listed with the council members who appointed them:

- | | |
|----------------------------------|------------------------------|
| 1. Kay Brandon | (by Yvonne Johnson) |
| 2. Alyson Best | (by Nancy Vaughan) |
| 3. Dr. Bob Davis | (by Jim Kee) |
| 4. Vic Nussbaum | (by Nancy Hoffmann) |
| 5. Jim Lewis (resigned mid-term) | (by Zack Matheny) |
| 6. Bob Mays | (by Trudy Wade) |
| 7. Tony Davies | (by Marikay Abuzuaiter) |
| 8. (Vacated) | (by T. Dianne Bellamy-Small) |
| 9. Mark Taylor | (by Mayor Robbie Perkins) |

Council Liaisons to the task force are T. Dianne Bellamy-Small and Nancy Vaughan.

Task Force meetings were held on the 1st and 3rd Tuesdays each month at 3:00 pm in the Melvin Municipal Building. At its first meeting, the Task Force elected Bob Davis as chair, Kay Brandon as vice-chair, and Alyson Best and Tony Davies as task force liaisons to the Council. The schedule, agendas, minutes and reports are available on the City's website at: <http://www.greensboro-nc.gov/index.aspx?page=3577>

The Task Force would like to acknowledge the tremendous assistance and support of the City's Field Operations Department staff and express its gratitude to the following staff members:

Dale Wyrick	Director
Nancy Lindemeyer	Communications Manager
Gail Hay	Field Operations Compliance Manager
Jason Jernigan	Interim Disposal Manager
Sheldon Smith	Solid Waste Collections & Recycling Division Manager

FOCUS AND GUIDING PRINCIPLES

The Task Force has focused on strategies to: 1) reduce the cost of MSW disposal to the City, 2) encourage regional cooperation, and 3) pursue a reduction in reliance on land filling, especially land filling of bulk, unprocessed municipal solid waste, while minimizing impacts on human health, economic development and the environment.

The Task Force believes that certain *guiding principles* should be followed in the pursuit of progress toward those goals:

1. Regional partners will only work together if there are clear advantages to doing so, i.e., when there is a Win-Win outcome, with no real or perceived losers.
2. Never be the first public entity in the U.S. to employ new technology at an operational scale; let others do the beta testing. Pilot-scale projects with shared risk may be OK.
3. When new (or even old) technology is employed, do so in a modular or scalable fashion. This means to commit only a portion of the waste stream to any one method of treatment or disposal. Most waste processing technologies are scalable, where a single unit is designed to process a fixed amount, say 100 or 200 tons per day. This is a technical way of saying "don't put all your eggs in one basket". This way, capital expenditures (and risk) can be limited and, depending on successes and failures in practice and evolving regulations and cost variables, adjustments can be made to increase or reduce reliance on any one disposal method. The result is a spreading of risk over multiple solutions, thus reducing the overall risk of failure.
4. Any technology pursued seriously should be subject to intense scrutiny by solid waste professionals, including scientific scrutiny in peer-reviewed journals. It should also be

carefully studied with regard to its impacts on human health, economic development and the environment. (See reference 2)

5. Given the current waste management paradigm (described in the MSW Disposal Subcommittee Report that follows) and the limited nature of this task force's capabilities, we have adopted and recommend a paradigm shift in long-term planning for Greensboro's waste disposal. Scientific innovation has historically taken long periods of time filled with failures and adaptations (i.e., trial and error). This seems to hold true in MSW management in the U.S. despite efforts by many entrepreneurs to develop the next great MSW solution, i.e., the "silver bullet". The recommended shift then is away from the search for a silver bullet and toward a strategy that emphasizes deliberate and steady progress, sustainability of purpose, and positioning for the evolution of MSW waste management into the post-landfill era (the longer long-term). A 10-year planning window seems appropriate for this purpose.

BEST AND/OR ALTERNATIVE PRACTICES IN NORTH CAROLINA

The Task Force reviewed best practices in the state to help develop our recommendations. While landfills continue to be the predominant method of disposal for municipal solid waste in North Carolina, some counties are using creative approaches to reduce the waste stream and thus reduce the amount of waste going into landfills.

Catawba County and its municipalities lead the state in recycling with 729.33 pounds per capita recovered compared to 212.69 pounds per capita in Guilford County, according to the 2010-2011 North Carolina Solid Waste and Materials Management Report (See reference 19). Catawba County's recycling rate is mostly attributed to their Regional EcoComplex and Resource Recovery Facility which, according to NCDENR, "is an innovative and interactive network of companies and operations that tries to match waste streams with the need for materials in the manufacturing of new products and energy sources." Catawba County also partnered with Appalachian State University to create the Biodiesel Research, Development and Production Facility (See reference 20).

Orange County leads North Carolina in waste reduction with 56 percent. In addition, they have developed a landfill gas recovery project, in cooperation with the University of North Carolina at Chapel Hill, which produces electricity for use on UNC-CH property. UNC-CH capitalized the project and owns the gas, infrastructure and related carbon credits. Orange County receives payment for facility operation (See reference 21). There are at least ten Landfill Gas-to-Energy projects statewide. Landfill gas is viewed as a favorable energy resource from the perspectives of the environment, economics and national energy goals.

Orange, Wake and Mecklenburg Counties each have some form of a solid waste advisory committee or commission appointed by elected county /city officials and comprised of citizens and solid waste staff and professionals. The purpose of these groups varies from advisory only

to participation in recommendations for waste management plans and strategies. (See references 21, 22 and 23)

It is worth noting that New Hanover County owns a nearly 30 year-old MSW incinerator that is currently shut down. It is a mass-burn, waste-to-energy (WtE) facility or “refuse-fired steam plant” utilizing decades-old technology with 20 year-old air pollution controls. The County ceased operation of the WtE plant, known as WASTECC, in April 2011 for “financial and political” reasons. The 500 ton-per-day WtE plant operated at 85 to 90 percent capacity and reduced input volume by roughly 85 percent, with ash and residue disposed of at the county landfill. On September 17, 2012, the New Hanover County Board of Commissioners rejected a contract to refurbish the WASTECC facility, leaving the county without a long-term solid waste solution. To fund the refurbishment and resume operation, tipping fees would have increased “from \$59 per ton to between \$88 and \$90 a ton”. (See references 7 and 8)

RECOMMENDED STRATEGIES

Recommended Strategies for MSW Disposal

Strategy 1: Begin study of, and eventually planning for, a MSW facility owned and operated by the City of Greensboro that will process MSW for volume reduction and other benefits (renewable fuels, waste-to-energy feedstocks, etc.), preferably one that may attract neighboring communities to utilize it with consideration for disposal of residue at their MSW landfill.

Strategy 2: Monitor advancements and/or alternative strategies and technologies in MSW disposal being utilized by other local governments in NC.

Strategy 3: Explore the feasibility of regional collaboration in solid waste disposal considering, among other things, potential mandated environmental and health regulations, advanced technology, required infrastructure, and fiscal parameters. Consider public regional landfilling options, preferably as an equity partner (e.g., Randolph County, Rockingham County).

Strategy 4: Explore the benefits of a regional administrative structure in the form of a waste management authority to serve as the managing body for future disposal of solid waste.

Strategy 5: Explore the feasibility of waste transport by rail as an alternative to trucking, assuming that the current MSW transfer strategy endures for the next 20+ years (rail transport is not believed to be feasible in the 10-year planning period due to a lack of industry infrastructure in NC).

Recommended Strategies for MSW Recycling & Reduction

Strategy 1: Ensure that multi-family units are incorporated into the city's curbside recycling routes wherever possible and ensure that public housing units are included in curbside recycling.

Strategy 2: Implement a pilot program using routing and Radio Frequency Identification Technology (RFID) to optimize route efficiency, measure program performance and track program participation.

Strategy 3: Encourage the *reduction* of waste requiring disposal by a) expanding the types of materials that can be accepted and processed at the recycling facility, b) promoting the practice of backyard composting, c) encouraging large commercial generators of food waste to divert organic materials from the waste stream, and d) supporting outside proposals/programs that offer services for recycling special wastes.

Recommended Strategies for Landfill Gas-to-Energy

Strategy 1: Issue a Request for Qualifications (RFQ) to outside vendors to explore and propose ways in which the White Street Landfill's excess methane could safely become a source of positive net revenue for the City, without adversely impacting the surrounding neighborhood. This approach invites commercial entities to produce plans for mutually profitable and environmentally friendly ways in which they would use the methane. More than a Request for Proposals (RFP), an RFQ is a request for ideas. (Refer to the Landfill Gas-To-Energy Subcommittee Report that follows.)

SUBCOMMITTEE REPORTS

MSW DISPOSAL SUBCOMMITTEE REPORT

Current Methods of Disposal and Greensboro's Current Situation

The predominate method of municipal solid waste (MSW) disposal in the U.S. and in North Carolina is the lined (sanitary) landfill. The reasons for the continuing dependence on landfilling are evident – low cost, simplicity and reliability. Landfills continue to be the most cost-effective disposal method, despite more technologically advanced alternatives that have been under development for at least 30 years.

The more technology-dependent alternative methods have been implemented in few full-scale applications throughout the U.S., and to a limited extent in NC, but have failed to gain widespread application because of high cost, inconsistent reliability, and/or technical and political challenges. Some success and longevity has been realized in geographic locations where landfills are prohibitively costly.

The mindset of local governments with active MSW landfills in this region is consistent – *what's mine is mine; let others take care of themselves*. Public landfills in Piedmont NC are reportedly all restricted by local policy to disposal of waste generated only within their jurisdictions. The basis for this protectionist thinking is that sharing remaining capacity of landfill space will accelerate depletion of that capacity, bringing the end of its useful life much closer to physical and political reality. Furthermore, citizens frequently cry foul to the idea of being another community's "dumping ground", regardless of financial incentives. This prevailing "every man for himself" strategy prevents the reduction of per-capita waste management costs, the benefits of shared risks,

and more isolated environmental impacts that would surely follow a regional, cooperative approach that could utilize economies of scale, more efficiently address mutual needs, and reveal synergies not yet realized.

Private waste companies with active, regional MSW landfills have happily filled the vacuum for those without landfills, taking anyone's waste who is willing to pay the going rate and provide or fund the collection, consolidation and transport of MSW to their facilities. Landfills can be huge revenue generators for those who own and manage them, as evidenced by the number of private landfills in existence and their operators' eagerness to fill and/or expand them with little hesitation. Since landfill tipping fees are largely dictated by the market rather than merely cost recovery, local governments in the landfill business often enjoy a net positive income, especially during periods of economic prosperity when waste generation is high.

For local governments like the City of Greensboro, who no longer own and operate MSW landfills within their jurisdictional boundaries, the preferred solution has been to consolidate and transfer their MSW to private, regional MSW landfills. Unfortunately, this solution is much more expensive than being self-sufficient, as evidenced by the high cost of waste disposal borne by residents who rely on the City to dispose of household garbage compared to when the City owned and operated its own MSW landfill. This greater expense is not only the result of the higher cost of infrastructure to consolidate and transport garbage to distant landfills, it is also the result of having *few options*, thus creating dependence on a limited number of commercial solutions (i.e., supply and demand). We are now dependent on the private waste management marketplace, funneling the profits out of our community to corporations headquartered elsewhere.

Next Generation Methods of Disposal

Alternative, technology-based methods of disposal seem to boil down to two categories, incineration (mass burning) and waste conversion. Incineration is a true form of waste-to-energy where energy released from waste combustion is typically used to run steam-powered turbines, generating electricity that is then consumed by a nearby industry or sold back to the local electric utility. Ash residue is typically landfilled (note the continued dependence on landfilling, characteristic of all alternative methods).

A) Waste-to-Energy

"Waste-to-energy (WtE) is the process of creating energy in the form of electricity or heat from the incineration of waste source. WtE is a form of energy recovery. Most WtE processes produce electricity directly through combustion, or produce a combustible fuel commodity, such as methane, methanol, ethanol or synthetic fuels." (Wikipedia, reference 18)

A detailed examination of waste-to-energy (WTE) is beyond the scope of this subcommittee, but it is useful to consider some current trends and opinions reported in non-peer-reviewed literature. The reader is referred to references 1, 11, 15, and 17 for examples.

B) Waste Conversion

Some waste conversion technologies currently in use or under development include the following:

1) Mechanical Separation and Pulverization (MSP)

“In many waste processes, and generally after re-use or recycling and any hand-picking, the residual waste is separated mechanically, and the material is often also pulverized with mechanical separation before or after, according to process requirements.” (See reference 5)

Manufacturers of waste shredding equipment include:

- SSI Shredding Systems, Inc. <http://www.ssiworld.com/applications/applications11-en.htm>
- DoppstadtUS <http://www.doppstadtus.com/?section=mswWaste>
- Continental Biomass Industries, Inc. (CBI) <http://www.cbi-inc.com/applications/msw.aspx>
- ARTECH Reduction Technologies
<http://www.artechreduction.com/Applications/Shredders/RDF-Shredders.aspx>

2) Mechanical Heat Treatment (MHT)

“Mechanical heat treatment (MHT) is an alternative waste treatment technology. This technology is also commonly termed autoclaving. MHT involves a mechanical sorting or pre-processing stage with technology often found in a material recovery facility. The mechanical sorting stage is followed by thermal treatment. This might be in the form of a waste autoclave or processing stage to produce a refuse derived fuel (RDF) pellet.” (Wikipedia, reference 6)

Example - WastAway®

WastAway®, an affiliate of Bouldin Corp., has developed a MHT process that converts unsorted household garbage into a product called Fluff®, which can be used in a variety of ways. Fluff® is similar in consistency to wood pulp, and can be processed for use as a growing medium for plants and turf, gasified to generate steam, converted to synthetic fuels such as ethanol, diesel, and gasoline, or compressed and extruded to make products such as construction materials.

WastAway’s® technology has been successfully recycling unsorted household garbage on a *commercial scale* for local governments in middle Tennessee for the past nine (9) years. The Caribbean island nation Aruba currently processes about half of its municipal solid waste using the WastAway® system. Otherwise, the U.S. military has been WastAway’s® primary customer because waste generated on offshore bases must often be transported back to the U.S. for disposal, and the WastAway® system creates a sterile, non-waste byproduct with a significantly reduced volume.

In a personal telecommunication with Bill Martin, a principal of WastAway®, he stated there are currently no pending contracts for expansion of WastAway® in the U.S. Mr. Martin stated that the net cost to operate the WastAway® system varies depending on the end use, but the “raw operating cost ranges from \$55 to \$75 per ton”. This cost can be offset by revenue from sales of the byproduct Fluff®, which he noted is usually greatest when sold to an existing power plant. He cites economics, i.e., tipping fee competition from landfills, as the primary barrier to expansion. His experience suggests that, for the system to be economically viable, there should

be a reliable market for the byproduct (Fluff[®]), and the sum of the facility's tipping fee (\$/ton) plus revenue from the sale of Fluff[®] should equal or exceed \$100 per ton of waste processed.

3) Mechanical Biological Treatment (MBT)

"A mechanical biological treatment system is a type of waste processing facility that combines a sorting facility with a form of biological treatment such as composting or anaerobic digestion. MBT plants are designed to process mixed household waste as well as commercial and industrial wastes." (Wikipedia, reference 4) (See also reference 5)

4) Plasma Arc Gasification

"Plasma gasification is a process which converts organic matter into synthetic gas using plasma technologies. A plasma torch powered by an electric arc is used to ionize gas and catalyze organic matter into synthetic gas and solid waste (slag). It is used commercially as a form of waste treatment; however, it has also been tested for the gasification of biomass and solid hydrocarbons, such as coal, oil sands, and oil shale. The process can both generate electricity while reducing the volume of waste." (Wikipedia, reference 9) (See also reference 10)

"(The) main disadvantages of plasma technologies for waste treatment are:

- Waste gasification and combustion ultimately releases carbon dioxide to the atmosphere;
- Large initial investment costs relative to current landfills;
- Requires large electrical energy input ; and
- Waste water from the process can be highly toxic." (Wikipedia, reference 9)

5) Thermal Depolymerization (TDP)

"Thermal depolymerization is a depolymerization process using hydrous pyrolysis for the reduction of complex organic materials (usually waste products of various sorts, often biomass and plastic) into light crude oil. It mimics the natural geological processes thought to be involved in the production of fossil fuels." (Wikipedia, reference 12) (See also reference 13)

Regional Opportunities & Formation of a Waste Management Authority

A more strategic component of the exploration of solid waste management options is to research the feasibility of regional (Piedmont) synergies and the development of various possible scenarios. The ensuing process for the City will likely include engaging in research to validate the need for and benefit of a regional concept and collaborating with regional partners to gain consensus.

Some suggested steps to explore this opportunity further include:

1. Document anticipated population growth by 2030 for each of the twelve (12) counties in the Piedmont Triad Regional Council (PTRC);
2. Focus on the most populated counties and those counties that will experience significant growth for initial discussions of collaboration;
3. Develop a roster of contacts including county commissioners, city council members and aldermen, county/city managers, and solid waste administrators;

4. Network with prospective collaborators and successful regional organizations to establish collaborative means and methods that can lead to consensus;
5. Identify benchmark solid waste partnerships in other states and study their histories, motives, successes and failures, synergies, and economic and quality-of-life outcomes;
6. Convene working groups to examine specific opportunities for collaboration in solid waste management; and
7. Explore the benefits of a regional administrative structure in the form of a waste management authority (e.g., Piedmont Solid Waste Authority) to serve all interested Piedmont counties as the managing body for future disposal of solid waste.

MSW RECYCLING & REDUCTION SUBCOMMITTEE REPORT

Staff assigned to the Recycling & Reduction subcommittee supplied information on best practices for local government recycling programs as requested by the subcommittee along with information from a recent conference. The subcommittee reviewed the best practices and recommends the following:

- (1) Ensure that multi-family units are incorporated into the city's curbside recycling routes wherever possible and ensure that public housing units are included in curbside recycling.
- (2) Implement a pilot program using routing and Radio Frequency Identification Technology (RFID) to optimize route efficiency, measure program performance and track program participation.
- (3) Expand the types of materials that can be accepted and processed. A best practices program works with their processors to collect the broadest array of materials possible while working to minimize residue and maximize the efficiency of the way those materials are handled.
- (4) Encourage and promote the practice of backyard composting. A best practices program is aware that organics in general and food waste in particular is a large part of the waste stream.
- (5) Encourage large commercial generators of food waste (restaurants, grocery stores, cafeterias, and even public schools) to divert their organic materials from the waste stream, either through public service or through policies that incentivize them to do so.
- (6) Support outside proposals/programs that offer services for recycling of mattresses and other special wastes.

LANDFILL GAS-TO-ENERGY SUBCOMMITTEE REPORT

The household garbage in the White Street Landfill produces a large quantity of methane gas as it decays. Methane, if left to escape into the atmosphere, is a much more dangerous greenhouse gas

than is carbon dioxide. At the White Street facility, as at any responsibly managed landfill, the methane is systematically vented and burned off, unless it can be diverted to some productive use.

Some 40 percent of the White Street Landfill methane is already piped to ITG (formerly Cone Mills) to burn and generate electricity for the plant's use. This transfer is made free of charge and as an economic incentive to ITG. The transfer agreement expires at the end of 2012.

Methane from a landfill is thus a valuable resource. The Task Force's Waste-to-Energy Subcommittee had as its main focus to research ways in which the White Street Landfill's methane could safely become a source of positive net revenue for the City, without adversely impacting the surrounding neighborhood. The White Street Landfill is apparently the largest source of methane in North Carolina that is not generating revenue.

Subcommittee activity also included research into what other communities do to make money from their waste methane. The subcommittee and some city staff visited a methane-to-electricity generation plant at the Wayne County (Goldsboro) landfill. The impression gained from this visit is that the appropriate technology is fully developed, very clean, and ready to be installed in a production mode in Greensboro. Such an installation would have a small footprint, and would be quiet and odorless.

Another idea that should be investigated further is whether White Street Landfill methane could be used to power the Osborne Wastewater Treatment Plant.

The subcommittee believes there might be several different ways of using the landfill gas, and this makes it difficult to produce a coherent Request for Proposals (RFP). Instead, the subcommittee has worked with city staff to develop a Request for Qualifications (RFQ). This approach invites commercial entities to produce plans for mutually profitable and environmentally friendly ways in which they would use the methane. More than an RFP, an RFQ is a request for ideas. We recommend the draft RFQ be presented to the City Council for approval.

RECOMMENDED CONTINUED CITIZEN INVOLVEMENT

Following the examples of other communities like Orange, Wake and Mecklenburg counties, we recommend continued citizen involvement as the City pursues the long-term planning recommended herein. Consideration should be given to forming a City commission (e.g., Waste Management Commission, Waste Strategies Commission, etc.) to provide City Council and staff with public input, technical research, and strategic planning on issues concerning all aspects of waste management and disposal. This commission should be structured and operate in a manner similar to other City commissions.

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Field Operations Department

June 4, 2012

TO: Denise T. Roth, Interim City Manager

FROM: Dale Wyrick, P.E., Field Operations Director

**SUBJECT: Greensboro Municipal Solid Waste Management Services
RFP #08-12, Evaluations of Proposals Received**

Please find the attached letter from Joe Readling, P.E., with HDR Engineering, Inc. of the Carolinas. The letter serves as an overview of the process used for evaluating the proposals received from the Request for Proposals #08-12 Municipal Solid Waste Management Services for the City of Greensboro. This information will also be presented to the City Council at their June 6, 2012 Work Session.

I have also included actual cost information for these services from FY2010-11 as you consider the comparison of the 3-year contract offerings provided by HDR (page 8 of 9 in the attachment). These FY 2010-11 costs were taken from the 13th month report from the Budget and Cost of Operations Statement for the Greensboro Transfer Station and can serve as a reference for comparing last year's annual and per ton costs to the projected costs of the offerings received.

FY 2010-11 Costs for Refuse Transfer Station (223,295 tons received in FY 2010-11)

Total Expenditures.....\$ 10,519,589 (includes debt service of \$826,373)

	<u>Annual Cost</u>	<u>Per Ton Cost</u>
Transport Cost (Hilco).....	\$ 2,946,540	\$ 13.20
Disposal Cost (Republic).....	\$ 5,425,162	\$ 24.30
Debt Service (City pays).....	\$ 826,373	\$ 3.70
Operate Cost (City).....	\$ 1,321,514	\$ 5.92
Total Cost.....	\$ 10,519,589	\$ 47.12
*Total Cost w/o debt service.....	\$ 9,693,216	\$ 43.42

**HDR cost comparison on page 8 of 9 of the attachment does not include debt service on the Transfer Station*

ddw

attachment: June 4, 2012 HDR letter

June 4, 2012

Mr. Dale Wyrick
Field Operations Director
300 W. Washington St.
Greensboro, NC 27401

Re: Greensboro Municipal Solid Waste Management Services RFP #08-12
Evaluation of Proposals Received

Dear Mr. Wyrick:

HDR Engineering Inc. of the Carolinas (HDR) provided technical support to the City of Greensboro (City) in the development of RFP #08-12 for Municipal Solid Waste (MSW) Management Services. This letter report is provided to summarize HDR's review and evaluation of the proposals received on May 10, 2012.

BACKGROUND

The City owns and operates the MSW transfer station located at 6310 Burnt Poplar Road. The City currently contracts with Hilco Transport, a local Greensboro hauling company, to transport the City's approximately 233,000 tons of MSW annually to the Uwharrie Landfill located in Montgomery County, NC located to the south of Greensboro near the town of Troy. On behalf of the City, Hilco operates a fleet of 13 on-road tractors and 26 trailers travelling nearly 1.5 million miles to transport close to 10,000 loads of waste from the City's transfer station annually. The City contracts for waste disposal with Republic Services, who manages over 800,000 tons per year of waste at the Uwharrie landfill. The contract with Hilco Transport expires June 19, 2012 but has terms for extension. The contract with Republic Services expires June 30, 2012, and is therefore the basis of the RFP's required implementation schedule of July 1, 2012.

RFP FORMAT

The RFP was structured with seven key sections:

- Section 1 – Introduction and Background Information, provides an explanation of the City's current waste system and other background information
- Section 2 – Terms and Conditions, provides the proposer with key requirements for a successful submittal
- Section 3 – Proposal Preparation Instructions, provides the proposer with a detailed explanation of information required with the submittal, including and outline of the response format
- Section 4 – Qualifications Forms, includes forms for respondents to provide complete details of the company's experience in waste management, references, etc.
- Section 5 – Price Forms, includes a price form for each of the six options
- Section 6 – Evaluation of Proposals, explains the evaluation process, and evaluation criteria to be utilized in review of responses

Section 7 – Contract Principles, provides key contract principles the City expects to be a part of the contract executed between the City and any offerer.

RFP OPTIONS SOLICITED

The RFP included solicitation for three primary services:

- Transfer Station Operations (Operate)
- Waste Transportation (Transport)
- Waste Disposal (Dispose)

Because of the potential for reduced cost to the city, various bundled options were also solicited. The following represents the six optional responses proposers could offer.

- Option 1 – Operate
- Option 2 – Transport
- Option 3 – Operate & Transport
- Option 4 – Dispose
- Option 5 – Transport & Dispose
- Option 6 – Operate & Transport & Dispose

In addition to the six options outlined in the RFP, two other key variables were addressed in the price forms: 1. Since the City does not have direct control of the approximately 230,000 tons per year historically managed through the transfer station, prices for various tonnage ranges were solicited; and 2. Four contract durations (3, 5, 10, and 15 years) were solicited.

PROPOSALS RECEIVED

Proposals were received from the following companies. Some companies quoted only one of the six options, while others quoted more than one option.

- Hilco Transport, Inc.
- FCR Greensboro d/b/a ReCommunity
- Republic Services
- Waste Connections, Inc.
- Waste Industries LLC

The following table includes the responses provided by each company to the six service options:

Options	Hilco	ReCommunity	Republic	Waste Connections	Waste Industries
1 - Operate	✓	✓			
2 - Transport	✓				
3 - Operate & Transport	✓				
4 - Dispose			✓	✓	
5 - Transport & Dispose			✓	✓	✓
6 - All Services			✓	✓	

Responses are summarized below:

- Option 1 – Two firms, Hilco and ReCommunity, offered individual services to operate the City's transfer station.
- Option 2 – One firm, Hilco, offered individual services to transport the City waste to a designated disposal facility.
- Option 3 – One firm, Hilco, offered bundled services to operate the transfer station and transport the waste.
- Option 4 – Two firms, Republic and Waste Connections, offered individual services to dispose of the City's waste.
- Option 5 – Three firms, Republic, Waste Connections, and Waste Industries, offered bundled services to transport and dispose of the waste. For this option, Republic would subcontract the hauling to Hilco, Waste Connections would subcontract the hauling to A-1 Sandrock, and Waste Industries would subcontract the hauling to Stafford Transport.
- Option 6 – Two companies, Republic and Waste Connections, offered complete bundled services to operate the transfer station, transport the waste, and dispose of the waste. For this option, Republic would subcontract the transfer station operations and hauling to Hilco and Waste Connections would subcontract the transfer station operations and hauling to A-1 Sandrock.

A brief description of each company follows.

Hilco Transport (Operate, Transport, Operate & Transport) – Hilco is a Greensboro-based hauling company incorporated in 1987. Hilco has managed the City's waste hauling since the transfer station was opened in 2006. They own a fleet of 144 road tractors, 22 dump trucks, 27 walking floor trailers, and 112 tipper trailers. Total fleet miles driven in 2011 were about 11 million miles. Hilco currently transports approximately 800,000 tons of MSW per year from nine different transfer stations in the Carolinas. They also currently operate two MSW transfer stations.

ReCommunity (Operate) – Formerly FCR, ReCommunity's focus is on recovering recyclable material from the waste stream. FCR has held the City's contract for over 18 years for processing and marketing of recyclables collected by the City. ReCommunity is the largest independent recycler in the country, and they own and operate 36 facilities in 14 states, processing and transferring nearly 2 million tons of recycled MSW each year. ReCommunity's stated primary interest in operating the City's transfer station is to recover additional recyclable materials from the waste stream that are otherwise destined to a landfill for disposal.

Republic Services (Dispose, Transport & Dispose, Operate & Transport & Dispose) – Republic Services is the second largest waste management company in the U.S. with over 30,000 employees nationwide. They own or operate five MSW landfills in North Carolina and have held the MSW disposal contract with the City since the City's transfer station was opened in 2006.

Waste Connections (Dispose, Transport and Dispose, Operate & Transport & Dispose) – Waste Connections was founded in 1997 and has become the third largest solid waste service provider in the U.S., focusing on secondary markets in the western and southern U.S. They manage 142 collection operations, 57 transfer stations, 37 recycling operations, and 45 active landfills. The proposed receiving landfill for disposal of the City's waste is located near Polkton, NC in Anson County. If selected for either the transfer station operations or waste hauling services, Waste Connections will utilize A-1 Sandrock, a Greensboro based firm. A-1 was founded in 1979 and

developed the MSW transfer station off Bishop Road in Greensboro that was then sold to Republic in 2004. A-1 also has a Construction and Demolition Debris landfill off Bishop Road, and they operate a fleet of 14 on-road trucks. Total fleet miles driven in 2011 were about 1 million miles. Additionally, Waste Connections has also named Fulcrum BioEnergy Inc. (Fulcrum) as an "alternative energy partner". Fulcrum was founded in July 2007 and is developing a process to convert garbage to ethanol. Fulcrum's first facility will be located near Reno Nevada and is anticipated to begin ethanol production in 2013.

Waste Industries (Transport & Dispose) – Waste Industries is headquartered in Raleigh and serves one million customers. They own or operate 8 landfills in the southeast, as well as 38 collection companies and 23 transfer stations.

EVALUATION PROCESS

The following is a restatement of key elements of the evaluation process as provided in Section 6 of the RFP.

"The City reserves the right to seek clarifications of proposers and to eliminate from further consideration Proposals which:

- are not in keeping with the City's requirements as stated in its RFP;
- propose cost fees considered insufficient or excessive in the City's opinion; or
- do not include the information in the format requested in its RFP.

Selection of a Contractor will not be based solely on low price but on the total evaluation process. The evaluation process will include the following:

- Proposals will be reviewed and assessed for completeness. An inventory of required information will be made for each proposal. Incomplete data may adversely affect the evaluation. Severely incomplete data will result in the proposal not being evaluated further.
- The Contractor's experience in the areas proposed will be reviewed and assessed in accordance with the minimum qualifications outlined. Proposals of those Contractors which meet the minimum qualifications will be evaluated further.
- The Contractor's project approach will be evaluated in greater detail, including its implementation schedule.
- A comparison of the cost proposal will be made. Identification of major omissions and inconsistencies will adversely affect the proposal evaluation.
- The strengths of the proposer's financial package will be assessed. The demonstrated ability of the Contractor to financially back up the guarantees relative to performance is of major importance.
- Acceptance of the terms and conditions contained in the Contract Principles will be reviewed and evaluated."

EVALUATION OF PROPOSALS

In accordance with the evaluation process outlined in the RFP and restated above, proposals were reviewed and assessed for completeness. Proposals were generally complete, with the exception of the Waste Connections proposal as related to a description of their transfer station operations and transportation services. Waste Connections proposed that those services would be performed by a

subcontractor, A-1 Sandrock, on behalf of Waste Connections. Following are a few of the elements found to be incomplete or otherwise lacking:

- Qualification Form 2A (respondents are to describe their transfer station operations experience) was reworded and cited only A-1's transportation experience, not transfer station experience.
- Form 2A specifically requests that the respondent list equipment proposed for operation of the transfer station (loaders, tamping crane, etc.). The only equipment listed was on-road trucks proposed for transportation services. No equipment appropriate for operation of a transfer station was listed.
- Qualification Form 2B (respondents are to describe their waste transportation experience) cited a reference project related to transfer station operations and hauling. The response in the proposal deviated significantly from the information received during contact with the reference.
- In Form 2B, Item 11 requests data on current over-the-road tractor-trailer vehicles. The response appears to cite the total fleet of A-1 Sandrock trucks (14 units) and not specifically over-the-road-tractor-trailer vehicles (subsequently related during the interview to be four units).
- Qualifications Form 3 – References – indicates that "the proposer shall provide a minimum of three (3) but not more than five (5) references of the most recently awarded and serviced (but not necessarily completed) comparable projects." Waste Connections enclosed a list of corporate experience and did not cite any specific references to contact. No specific references (including contact information) were provided by A-1 Sandrock. One letter of reference was provided by A-1 after the due date of the proposals.

Following review of the completeness of the proposals, each contractor's experience in the area of service proposed was reviewed. Most of the experience cited complied with the guidelines of the RFP. However, the experience cited in the Waste Connections proposal related to the transfer operations and waste transportation services proposed to be performed by A-1 Sandrock was lacking. The following are a few key areas where either the information was lacking, or, based on what was submitted, A-1's experience did not meet the guidelines:

- Section 3.6, Chapter 4 - Experience of the RFP (page 3-4) states:
"The proposer should demonstrate experience...for successfully operating MSW transfer stations... and/or providing transportation services from transfer stations which receive a minimum of 100,000 tons annually. The proposer should have three (3) awarded and serviced...comparable projects..."

While Waste Connections can, and did, cite their corporate experience that meets this, A-1 Sandrock appears to have no prior projects that meet these standards. Since A-1 is the proposed service provider for the transfer station operations and waste transportation services, their ability to demonstrate this experience is important.

- Section 3.6, Chapter 5 - Project Approach of the RFP (page 3-4) states:
"...The proposals should provide a project approach which addresses staffing, equipment, and operational strategies applicable to the services being offered..."

Further, the RFP enumerates other specific details of required content in the proposer's project approach, including how the proposer intends to accomplish the transition into the work within the required schedule. The Waste Connections response is brief and addresses only the landfill equipment to be utilized for disposal. The project approach section of their proposal did not provide information regarding staffing, equipment, and operational strategies related to the A-1 Sandrock proposed services of transfer station operations and waste transportation. Additionally, the project approach does not address how A-1 will accomplish a smooth transition into full production of the work by July 1, 2012 as required. Again, these issues are considered by HDR to be vitally important, particularly when the proposed subcontractor cannot cite experience with comparably sized projects for either of the services they propose to provide.

In HDR's opinion, the Waste Connections proposal lacks important detail as related to the transfer station operations and waste transportation services which A-1 Sandrock would perform under the subcontract arrangement with Waste Connections. Additionally, the Waste Connections proposal does not cite adequate project experience for A-1 Sandrock comparable to the services being offered, nor does it provide an adequately detailed project approach for how these services will be implemented within the allotted time. **For these reasons, HDR recommends that the City only consider the Waste Connections proposal as related to service *Option 4: Dispose Only*, and that their proposal not be considered further for service *Option 5: Transport & Dispose*, nor for service *Option 6: Operate & Transport & Dispose*.**

PROPOSAL PRICING

Price Form 1 of the RFP included tables for proposers to complete their pricing offers. For each of the six options, four different annual tonnages ranges were provided ranging from a minimum of 60,000 tons per year (the approximate tonnage the City collects on residential collection routes) up to 250,000 tons per year. Additionally, the price form included the ability for proposers to offer different unit prices for 3, 5, 10, and 15 year contract terms.

Price Form 2 allowed respondents to cite inflationary indices, if any, that would be used to escalate the base rates offered in Price Form 1. The most common indices cited by respondents were use of some variation of the Consumer Price Index (CPI) and some variation of a fuel escalator to accommodate changes in fuel prices.

The base rates provided by each respondent in Price Form 1 cannot be directly compared due to variations of the inflation indices and fuel escalators proposed by each company. To provide equal comparison of pricing, HDR developed a spreadsheet model that incorporated each respondents proposed indices and escalators, resulting in comparable life cycle cost.

There are four possible scenarios for combining the service options. They are as follows.

- Operate, Transport, Dispose: this scenario assumes the City contracts with different service providers for each service.
- Operate & Transport, Dispose: this scenario bundles transfer station operations and transportation (Option 3) with one company, with disposal services (Option 4) provided by a separate company.

- Operate, Transport & Dispose: this scenario assumes transfer station operation services (Option 1) by one company and bundles transportation and disposal services (Option 5) with a separate company.
- Operate & Transport & Dispose: bundles all three services under one contract (Option 6).

HDR prepared a model to compare the relative cost of each contract combination assuming a 3-year contract term and waste tonnage in the 200,001 to 250,000 tons per year range (over the last three years, the tonnage received at the City's transfer station has averaged 233,000 tons). The costs utilize the inflation index and fuel escalator basis proposed by each respondent. For purposes of the initial model evaluation, the inflation index (i.e., CPI) was averaged over recent years and used to forecast future escalation of prices. Similarly, diesel fuel cost over recent years was averaged and used to forecast future diesel fuel prices. The approximate annual rate of increase for diesel fuel over the last 15 years is 7.43%.

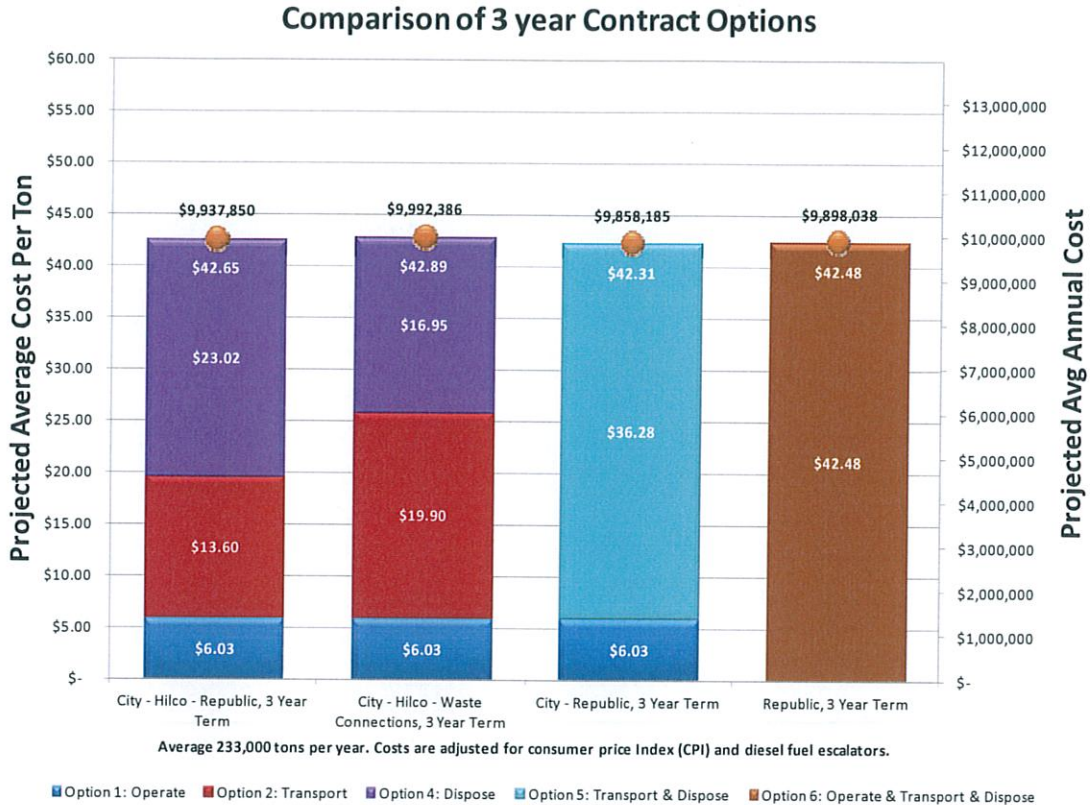
Using the information from the model, the Waste Industries pricing, which offered bundled transportation and disposal services in response to *Option 5: Transport & Dispose* (utilizing their MSW landfill in Sampson County) is several dollars per ton higher than the other proposals which rely on either the Republic operated landfill in Montgomery County or the Waste Connections landfill in Anson County. **Therefore, HDR recommends that the Waste Industries proposal not be considered further.**

Hilco and ReCommunity offered services related to *Option 1: Operate Only*. The cost per ton is about six dollars, which is very similar to the estimated cost for the City to operate the transfer station. It should be noted that the ReCommunity cost does not account for the potential disposal savings that could be realized if they recover recyclable material from the transfer station. However, HDR believes the City would be best served to complete the ongoing solicitation process related to processing and marketing of recovered recyclable materials prior to considering adding a recycling component to the City's transfer station. **Therefore, unless the City prefers to outsource the transfer station operations to a private contractor for reasons other than substantial savings, HDR recommends that the Hilco and ReCommunity offers in response to Option 1: Operate Only, not be considered further. Additionally, since there are no savings realized by contracting with Hilco for the bundled services of Option 3: Operate & Transport, HDR recommends that option not be considered further.**

Applying these recommendations narrows the selection of options to those most viable, as indicated by the remaining checkmarks in the following table.

Options	Hilco	ReCommunity	Republic	Waste Connections	Waste Industries
1 - Operate	X	X			
2 - Transport	✓				
3 - Operate & Transport	X				
4 - Dispose			✓	✓	
5 - Transport & Dispose			✓	X	X
6 - All Services			✓	X	

The following graph shows the relative cost of each remaining contract option assuming a three year contract term. Costs are reported as the average annual cost for the term.



As indicated, the cost of service for each of the remaining options is very similar. HDR recommends the City select from these combinations for a 3 or 5-year contract term. It should be noted that these cost of service estimates do not include debt service on the transfer station; debt service on the transfer station will apply regardless of the option selected.

HDR appreciates the opportunity to be of service to the City and looks forward to further discussion regarding the MSW management RFP and proposals received.

Respectfully,

HDR Engineering, Inc. of the Carolinas

Joe Readling, PE, VP

LANDFILL GAS SUMMARY

Field Operations Compliance Manager Gail Hay gail.hay@greensboro-nc.gov

Description of Operation

Landfill gas is a natural by-product of the anaerobic decomposition of organic waste in a landfill. By volume, landfill gas is approximately 50 to 55 percent methane, 45 to 50 percent carbon dioxide, less than 5 percent nitrogen, and less than 1 percent non-methane organic compounds (NMOCs). Methane is flammable at 5 to 10 percent in air, by volume. The production of landfill gas creates positive pressure within the landfill that forces gas to migrate. The City of Greensboro operates the landfill gas collection and control system at the White Street Landfill in compliance with state and federal regulations in order to control migration as well as control the emissions of NMOCs.

The landfill gas collection and control system consists of a network of extraction wells and collection piping. Vacuum is provided to the collection system through the use of two blower/flare stations. The landfill gas can be transported via underground piping to International Textile Group (ITG) for use in their operations. The flare is used to combust excess landfill gas. Federal and state regulations require routine monitoring, recordkeeping, and reporting.

3-Year Average Volumes/Output

Year	Phase I/II			Phase III			Total Gas System			
	Flared	To ITG	Total	Flared	To ITG	Total	Flared	To ITG	Overall	
2009	149,265	328,741	478,006	534,493	67,278	601,771	683,758	396,019	1,079,777	37% to ITG
2010	117,517	467,415	584,932	799,189	1,818	801,007	916,706	469,233	1,385,939	34% to ITG
2011	68,810	489,651	558,461	595,631	0	595,631	664,441	489,651	1,154,092	42% to ITG
3-yr Avg	111,864	428,602	540,466	643,104	23,032	666,136	754,968	451,634	1,206,603	38% to ITG

Assumptions/Notes:

LFG output is expressed as standard cubic feet per minute (scfm) x 1,000

3-Year Average Costs of Operations

Fiscal year	Landfill Compliance Net Cost of Operations
2008/2009	\$232,787.32
2009/2010	\$111,385.65
2010/2011	\$151,433.11

MUNICIPAL SOLID WASTE (MSW) SUMMARY

Interim Disposal Manager Jason Jernigan jason.jernigan@greensboro-nc.gov

Description of MSW Operations

Currently, the City manages its municipal solid waste through a transfer station (N.C. Permit No. 4120T). The transfer station is owned and operated by the City of Greensboro. All MSW is transported and disposed of at the Uwharrie Landfill located in Montgomery County, NC. The City contracts for these out of county transportation and disposal services with private entities. The current transportation contract is with Hilco Transport and the disposal contract is with Republic Services.

At the Transfer Station, the city is responsible for loading acceptable waste types and volumes, securing the loads, and having the trailers ready for connection and hauling. The transfer station ranges from 400 to 1,400 tons disposed of daily and averages around 4,300 tons disposed of weekly. All waste disposal activities are regulated by the U.S. Environmental Protection Services, N.C. Department of Environmental and Natural Resources, and Guilford County with respect to operations, monitoring, future planning and construction, as well as long term care.

3-Year Average Volumes/Output

MSW Tons Disposed	2008/2009	2009/2010	2010/2011	3-Year Average
Private Haulers	95,556	100,070	94,012	96,546
City Haulers	143,250	136,839	129,284	136,458
Total	238,806	236,909	223,296	233,004

3-Year Total Revenue Breakdown

Hauler	2008/2009	%	2009/2010	%	2010/2011	%
Private Haulers	3,946,176	40%	4,143,241	42%	3,901,444	42%
City Haulers	5,867,877	60%	5,619,181	58%	5,309,182	58%
Total	9,814,053		9,762,422		9,210,626	

3-Year Average Costs of Operations

Fiscal Year	Total Expenditure & Budget	Total Revenue	Net Cost of Operations	Cost Per Ton
2008/2009	9,812,341	-9,814,053	-1,712	\$41
2009/2010	10,089,862	-9,762,422	327,440	\$43
2010/2011	9,976,815	-9,210,626	766,189	\$45
3 Year Avg	9,959,673	-9,595,700	363,972	\$43

*Total Revenue= revenue collected from both City haulers and private haulers

*Cost Per Ton = Total Expenditure & Budget / MSW Tons Disposed

RECYCLING COLLECTION SUMMARY

Solid Waste Collections & Recycling Division Manager Sheldon Smith sheldon.smith@greensboro-nc.gov

Description of Recycling Operation

Greensboro’s recycling program began in the early 80’s with the “Humpty Dumpster” pilot program for newspaper collection. Fully automated curbside collection began in 1993 with 96-gallon automated carts. The program has been single stream from inception and ReCommunity (FCR) has processed our materials since the beginning. Citywide commercial recycling collection for businesses began in 1994. The Household Hazardous Waste drop-off program began in 1994 and is free for all Guilford County residents. Popular Science magazine listed Greensboro as one of the Top 50 Greenest Cities in America in 2008.

Currently, the City of Greensboro offers one of the most comprehensive set of recycling services of any municipality in North Carolina. Our program includes over 80,000 residential collection points ranging from single-family homes, townhomes, condos and over 1,000 commercial business and apartment dumpster customers, 21 public recycling drop sites and Central Business District (CBD) services. Community and business outreach efforts and our processing contract are administered by our Waste Reduction section, including one waste reduction supervisor, one education specialist, one inspector and two business development representatives. Since 2006, Solid Waste has continued to evaluate all collection services to gain more efficiency and reduce collection costs. Our processing contract with ReCommunity was amended in 2007 and reduced processing costs by a million dollars to the current processing cost of \$700,000 and still maintained a revenue share.

Prior to 2007, commercial recycling dumpster customers received services free of charge. Solid Waste implemented a fee structure for commercial recycling and offers multiple collection days for businesses. In January 2008, Solid Waste changed the weekly residential recycling collection to every other week and reduced collection routes from 10 routes to 8 producing \$150,000 first year savings. This change increased set-out rates from 35% to over 60%. Currently, there are seven dumpster collection routes, including a separate multi-family dumpster route. Additional services include fee-based ABC beverage container recycling services for 254 customers, appliance collection and electronic waste (E-Waste) services at no charge. Since 2007, Solid Waste has received over \$358,000 in State and Federal grants to expand our collection programs. Federal funding was received to increase recycling access opportunities for recycling for City facilities, Public housing, and additional 300 multi-family complexes.

Solid Waste Recycling Collection FY09-FY11	FY 09		FY 10		FY 11	
	Residential Recycling	Commercial Recycling	Residential Recycling	Commercial Recycling	Residential Recycling	Commercial Recycling
BUDGET	\$2,638,423.00	\$1,039,186.00	\$2,622,123.00	\$959,712.00	\$2,269,438.00	\$832,077.00
Tonnage Figures						
Total FY Tons	17,831.50	12,125.87	17,486.15	11,359.04	18,268.88	10,840.59
Collection Cost per Ton	\$147.96	\$85.70	\$149.95	\$84.49	\$124.22	\$76.76
Coll. Cost per Ton w/o Rev	\$148.20	\$133.04	\$150.17	\$130.45	\$124.39	\$125.52
Processing Cost Per Ton	\$167.96	\$108.70	\$169.95	\$104.49	\$144.22	\$96.76
Collection Points						
Collection Point	74,783	1,274	76,764	1,241	80,251	1,187
Cost Per Collection Point (Yr)	\$36.28	\$815.69	\$34.16	\$773.34	\$28.28	\$700.99
Cost Per Month	\$2.94	\$67.97	\$2.85	\$64.44	\$2.36	\$58.42
Annual Tons	29,957.37		28,845.19		29,109.47	
Annual Revenue Received	\$234,096		\$249,395		\$566,511	
ABC Collections Revenue	\$63,854		\$65,130		\$75,870	