

AN ANALYSIS OF THE
WESTMORELAND COUNTY
WASTE-TO-ENERGY FACILITY

*by William A. McDonald, Research Fellow
Allegheny Institute for Public Policy*

*Allegheny Institute Report #97-10
August 1997*

TABLE OF CONTENTS

Survey of Findings	2
Introduction	4
Description of the Waste-to-Energy Plant	4
Critical Issues	4
Financial and Operating Profile	9
Possible Options	11
Reasons to Shut Down the WTE Plant	14
Reasons Not to Shut Down the WTE Plant	15
Scenario Analysis	16
Policy Recommendation	21
Appendix	22

Survey of Findings

Westmoreland County Waste-to-Energy (WTE) Plant

1. Operational Efficiency: Various operating challenges exist that result in high maintenance costs and continual capital investment of scarce financial resources. The plant is very small by industry standards. The WTE is designed to burn only 18,250 tons of municipal solid waste (MSW) annually at full capacity. The typical WTE plant in the private sector burns 1.1 million tons per year. Economies of scale in the "trash-to-cash" business are geometric as opposed to linear as is commonly assumed. The high cost structure is not likely to fall beyond its present level.

2. Cost of Steam: After deducting "tipping fees" from WTE costs and ignoring depreciation, steam costs two to three times more to produce than in the Boiler House. From January through May of this year, tipping revenue increased and downtime has been reduced. However, the cost per unit of steam has increased 3.3%, from \$15.55 in 1996 to \$16.06 as of May 1997.

3. Alternative Fuels: Retrofitting for different fuels or installing additional material handling equipment might marginally improve efficiency of the burn, but will increase operating costs. A rule of thumb in the MSW incinerator business is that every time garbage is handled operating, maintenance and capital costs rise.

4. Supply/Demand Conditions: The economic environment and market conditions will remain fairly constant. Western Pennsylvania has more landfill space than anywhere in the country. Ohio also has an abundance of landfill space. Three potential privatization deals in Pennsylvania and Ohio have fallen through because of their close proximity to the "landfill capital of the world." The supply of landfill capacity far outstrips demand. This drives tipping fees down or keeps them at lower levels than elsewhere in the country.

5. Financial Reporting: A single set of accepted financial reporting concepts does not exist. All departments of the county should use common practices and correct principles for their data gathering and reporting. This distinct void causes confusion and handicaps decision-making ability.

6. Privatization: Three main factors rule out a privatization initiative by either contract management or sale of the assets. First, operating costs are too high and can not be effectively lowered. Second, the abundance of landfills in Westmoreland County makes a steady MSW fuel source unreliable. Finally, the sale of steam to customers at "over market" rates increases the business risk of the WTE to the point that future revenues are in jeopardy. Nationally, commercial steam sells for \$5/unit and sells for \$10 per unit in Pittsburgh. The plant is too small for a private sector firm to deal with. An entrepreneur would be unlikely to have the financial power to fund capital investments, appreciably lower costs or maintain the current selling price for steam over the long run.

7. Steam Capacity: The Boiler House at its present size has ample capacity to meet the needs of the four customers. Their 1996 steam needs could have been met by the Boiler House alone running at 37% of capacity (4 boilers running) or 75% of capacity (2 boilers running) depending on the number of boilers in operation at any one time. There is no real need for the WTE's steam capacity.

8. Over Market Steam Contracts: The price of steam to its customers is far above the market value of commercial steam. The price was raised in 1992 when the State Prison became a customer. The current contract level of \$14.45 is 2 to 3 times higher than market prices. These artificial economics have shielded the high cost and inefficiency of the WTE. It benefits the County as long as they can charge

these prices, but market forces will eventually prevail. An interview with members of Penn State University's Energy Engineering Institute revealed that the state prison at Greensburg has the highest steam cost of the 25 state prisons throughout the Commonwealth. A simple "make-or-buy" decision analysis will quickly conclude that an alternative source to the WTE/Boiler House complex will produce sufficient cost savings to the State.

9. Shut Down the WTE: A series of scenarios are developed that support a complete shutdown of the facility in its current state. The market value of its assets is virtually zero. Its cost structure is too high and its productive capacity is not needed. At best, it could be refitted with gas burners to serve as backup to the Boiler House.

- Scenario #1, the "baseline scenario", examines 1996 actual sales priced at \$14.45 per thousand pounds. In 1996, the County benefited by \$519,068 from its steam operations.
- Scenario #2 calls for a shutdown of the WTE, with all steam production at the Boiler House with a cost of \$5.74/unit. Overall operating profit would rise from \$682,890 in the baseline scenario, to \$1,078,745—an increase of \$395,855.
- Scenarios #3 and #4 assume the state prison leaves as a customer. The WTE remains operational in #3 while it is assumed to shut down in #4. Gross steam revenues fall from the loss of its second largest customer under each scenario. However, the County would have a net benefit of about \$287,756 by shutting down the WTE.
- Scenario #5 looks at the price for steam being lowered to a realistic market price of \$8-9 per unit. Option #5A assumes the state prison stays as a customer and the WTE shuts down. Option #5B is the same as #5A except the WTE remains operational. The overall difference to the County from the WTE shutting down versus remaining open is around \$395,852. This value is similar to the benefit described under scenario #1. Regardless of the scenarios examined, the benefit to the county from a WTE shut down is roughly \$400,000.
- "Tipping fees" would have to increase to \$36.16 for the county to break even at the lower \$8 steam price. It would have to increase to \$77.60 for the county to recoup the \$395,852 benefit lost because the WTE was not shut down. The prospect that tipping fees can increase to these levels defies economic reality.

Introduction

The County of Westmoreland operates a Waste-To-Energy (WTE) steam production plant. Until the present time, it was an operating department of the county's nursing facility (the Westmoreland Manor). Both the WTE and the Boiler House were transferred to the Department of Public Works on July 1, 1997. The WTE plant has become a topic of discussion in recent years centering on a series of issues that have prompted calls for change with regard to the future of the WTE facility. The County Commissioners have given the WTE six months to plan and implement any necessary changes before a decision on its fate is rendered at the end of 1997.

Description of the Waste-to-Energy Plant

The WTE is an incinerator/boiler system that is fueled by municipal solid waste (garbage). The steam is used by the Westmoreland Manor, as well as by three other customers: the County Jail, the HUD Hi-Rise and the State Correctional Facility at Greensburg. The four customers use the steam mainly for heating.

The WTE receives its municipal solid waste (MSW) from haulers and waste disposal companies. These commercial haulers pay "tipping fees" to dump their loads at the plant, and the tipping fees for receipt of MSW are considered as a reduction in the cost of steam produced. The sales of steam to its outside customers generate revenue for the plant.

A complicating issue is the dual steam production facilities. The WTE operates side-by-side with a traditional gas-fired boiler house. Each facility produces steam which is piped together and then split off to separate lines for each customer. The steam originating from each source is metered so an accurate measure of the mix is obtained. Of late, the WTE provides about 30%, whereas the Boiler House provides the remaining 70% of the steam generation.

Critical Issues

A number of key issues are being raised in various areas: operational responsibility, financial impact, plant efficiency, and the relevance of such a facility in today's economic environment. Each of these issues is analyzed below.

1. Operational Efficiency. The plant is an operational "challenge", to say the least. From its inception, the plant has performed below expectations. Modifications to the original design were necessary in an effort to boost efficiency. Maintenance has been a particular problem. Original specifications called for routine maintenance and cleaning every 6 months, but the plant requires maintenance about every 2 weeks in order to assure acceptable performance. This is an improvement because maintenance shutdowns had been occurring once a week for a long period of time. This frequent maintenance schedule results in higher labor costs and supplies, as well as, furnace downtime. These have a serious negative impact on the overall performance of the facility.

The original design and operating projections represented a "Best-of-the-Best" scenario. Initial specifications called for a heat value of 5,300 BTUs per incinerator per hour. Past experience reveals a heat value of roughly one half or 2,650 BTUs. The Westmoreland

THE WTE PLANT HAS BECOME A TOPIC OF DISCUSSION IN RECENT YEARS CENTERING ON A SERIES OF ISSUES THAT HAVE PROMPTED CALLS FOR CHANGE WITH REGARD TO THE FUTURE OF THE WTE FACILITY. THE COUNTY COMMISSIONERS HAVE GIVEN THE WTE SIX MONTHS TO PLAN AND IMPLEMENT ANY NECESSARY CHANGES BEFORE A DECISION ON ITS FATE IS RENDERED AT THE END OF THE YEAR (1997).

County WTE is one of only two plants of this design in existence. The configuration was improved upon when other plants were constructed that corrected certain design flaws.

The principal operating inefficiencies are:

- More frequent downtime accelerates the deterioration of the tubing system which increases repair and maintenance costs.
- The lower BTU value increases bottom ash and fly ash levels, thereby increasing the disposal costs of these residual materials.
- Natural gas is required to burn the MSW, which raises the operating costs of the incineration and steam production process.
- The moisture content of MSW can be quite high. This requires additional natural gas to first "dry" the garbage so it is in a combustible state.
- The MSW the plant receives must be sorted to separate out unallowable materials. Metal, glass, old appliances, newspaper, grass clippings, propane gas tanks, etc. are often dumped into the refuse bunker by haulers which will not burn, burn poorly or damage the equipment.
- One of the biggest hurdles has been obtaining a steady stream of MSW. An insufficient quantity of MSW forces the operators to either shut down one incinerator or to supplement the burn with natural gas. A key driver in the success of WTE type incinerators is whether or not the incinerator has a long term, captive source of MSW from the plants host municipality. When a "trash-to-cash" facility has to compete for its fuel supply with land fills, the operation is subject to high levels of business risk.
- The bottom ash left after the burn can range from 15-30% of the MSW fed into the system. As cited above, a lower burn temperature can cause higher ash percentages, the composition or consistency of the type of the material used as fuel. The ash is dropped into a water quench for cooling before a conveyor moves the material into a refuse container. The moisture level of the ash increases its weight and results in higher tonnage at a landfill increasing the WTE's own dumping costs.

When the MSW is burned (albeit supplemented with natural gas) the WTE boilers do efficiently generate steam. The inefficiencies arise mainly out of the raw fuel (garbage) composition and the ash disposal process. The low supply of MSW, its ever-changing composition, moisture level of the MSW and the moisture level of the bottom ash are the main culprits contributing to the plant's inefficiency.

On the whole, the WTE operation functions at or above state permit specifications. The minimum BTU and emission standards are being met. The plant has not been fined or penalized to any notable degree. An aggressive maintenance schedule, the natural gas supplement, and constant "tweaking" of the system have accomplished these accolades.

2. Economic Environment. Today's economic environment has changed dramatically from the time the plant was proposed and constructed back in 1986. Two factors are most prominent:

- A. Solid Waste Disposal Cost:** Tipping fees were averaging \$30-40 per ton as recently as 5 years ago. Landfill space was expected to be scarce, and the WTE looked to take advantage of these lucrative tipping fees. More landfill space became available because:

ONE OF THE BIGGEST HURDLES HAS BEEN OBTAINING A STEADY STREAM OF MSW...A KEY DRIVER IN THE SUCCESS OF WTE TYPE INCINERATORS IS WHETHER OR NOT THE INCINERATOR HAS A LONG TERM, CAPTIVE SOURCE OF MSW FROM THE PLANTS HOST MUNICIPALITY. WHEN A "TRASH-TO-CASH" FACILITY HAS TO COMPETE FOR ITS FUEL SUPPLY WITH LAND FILLS, THE OPERATION IS SUBJECT TO HIGH LEVELS OF BUSINESS RISK.

- Compaction of material in existing “cells” of a landfill enables each cell to hold more waste products.
- Increasing the height or depth of cells allows larger quantities to be held in each cell.
- Enlarging present landfills and the development of new sites have increased available landfill capacity. There are seventeen landfills in Western Pennsylvania, nine of which are in Westmoreland County.

These developments are due to improved technology in landfill operations and/or by the relaxation of governmental regulations in the issuance of permits. Interestingly, the prominence of community recycling programs is not a major factor in this increase in landfill space. Alternative disposal through recycling has had an impact on lowering MSW volume somewhat. However, the volatility of the recycling market is a unique phenomenon on to itself and is really not in the equation.

The WTE faces greater competition in the marketplace in attracting and maintaining a steady flow of garbage from a reliable customer base. A critical success factor in MSW-to-Energy operations is an exclusive, long term contract with municipalities that guarantee a steady stream of MSW are low cost. Tipping fees are now averaging \$15-26 per ton. This is about a 50% reduction in the revenue per ton over the past few years.

B. Natural Gas Prices: In the early 1980's when the WTE was first conceived, natural gas prices were expected to rise substantially over time. The WTE was seen as a way to hedge the rising cost of energy to the Manor and Hi-Rise.

Overall, the current markets for landfill space and natural gas are very competitive. Instead, under the current price structure, this type of plant would be unfeasible if constructed today. This fact is driven home by the existence of two large WTE plants in Ohio that are shut down. An Akron, Ohio incinerator has been idled for several years and has defaulted on over \$40 million of debt. A similar plant in Franklin County, Ohio (near Columbus) has been idled for the past year. An RFP has been issued, but to date no private operators have been willing to take on the plant. Meanwhile, the City of Columbus is funding its debt service and other costs for the facility. Ohio is similar to Pennsylvania in that there is an over-abundance of landfill space, which severely handicaps WTE facilities. The nation's largest and most successful “trash-to-cash” company, American Ref-Fuel, recently rejected an offer to acquire an incinerator in the Lancaster, PA area due mainly to its close proximity to the abundant landfills in Western Pennsylvania.

3. Impact on the Westmoreland Manor. The WTE was conceived as a dependable, low cost source of energy primarily to serve the Manor. It was to be transferred to the Westmoreland County Department of Public Works on July 1, 1997. Up until this time, the WTE had been a separate department and cost center under the authority of the Manor's administration. The organizational structure (being a department of the Manor) had a negative impact on the costs of the Manor and on the cost reimbursements from 3rd party health care providers, mainly PA Medical Assistance. In essence, since the WTE services outside customers, only the percentage of steam piped to the Manor could be reimbursed by the state. For example, if 30% of the WTE output serviced the Manor, roughly 30% of related costs were eligible for reimbursement. These costs included both plant operations and administrative costs.

OVERALL, MARKET FORCES ARE VERY COMPETITIVE FOR LANDFILL SPACE AND NATURAL GAS PRICES AS COMPARED TO THE SHORT SUPPLY AND TIGHT MARKET EXPECTATIONS THAT PREVAILED OVER THE PAST 10 YEARS. MARKET PRICES HAVE FALLEN TO SUCH A LOW POINT THAT UNDER THE CURRENT PRICE STRUCTURE THIS TYPE OF PLANT WOULD BE UNFEASIBLE IF CONSTRUCTED TODAY.

The motivation for separating the WTE and Boiler House from the Manor is the Manor now becomes a "paying customer." Revenue to the WTE will be much higher since the Manor will pay the same \$14.45 per unit, instead of capturing partial reimbursements from Medical Assistance.

4. Conflicting Financial Reporting. The principles of financial analysis call for entities such as the WTE to be analyzed on a "Stand Alone" basis. This means that all relevant costs are identified and included in the analysis. Relevant costs are both cash costs such as normal operating costs, opportunity costs and non-cash costs such as depreciation. Revenues must be identified, especially the "value" of the steam used by the Manor (prior to it being a paying customer).

The points of financial reporting disagreement are:

- Depreciation is a relevant cost of capital consumed in the productive operations of a facility. Heated debate on its inclusion or exclusion from the financial statements is ongoing.
- Whether the value of steam used internally by the Manor over the years is included at cost reimbursement or its market value in an opportunity sense at the \$14.45 price.
- Certain overhead costs are allocated to the WTE. The issue is whether all relevant administrative and support costs are fully reflected.

As a result of these differences, significant disagreement exists as to what are and how much it really costs to operate the WTE and the Boiler House. Depending on which accounting methods are used and which county department performs the reporting, the bottom line can range from a large loss to a large profit. The distinct absence of a strict set of financial guidelines that are used by all interested parties alike create inaccurate financial results and obstruct one's judgment and decision making ability.

The county controller recently performed an audit review of the WTE in an effort to determine relevant costs and revenues. (It is noted that the audit has generated significant disagreement among differing factions who dispute their methods and results.) According to the recent audit there is a large differential between the cost of steam produced by the WTE (\$22.45/1000 pounds) and that of the boiler house (\$5.60/1000 pounds). While these figures are subject to debate, there is common agreement that the WTE results in much "costlier" steam to produce than its adjacent gas fired boiler house.

5. Unneeded Capacity. The boiler house currently has ample capacity to serve the Manor and its three outside customers. The State Prison was built in 1992. Two new boilers were then added to serve the prison that increased Boiler House capacity to 45,000 pounds per hour. This equates to 394.2 million pounds of steam annually. Up until 1992, WTE's steam production was necessary to meet the county's commitments to its customers. The WTE is really not needed now to meet steam supply needs. Total steam production by both systems for 1996 was 147,272,000 units, or 37% of the capacity of the Boiler House alone (assuming all four boilers running at maximum.) If just two boilers run while the other two sit idle, the 1996 steam production would have been 75% of Boiler House capacity alone. These figures exclude any steam production from the WTE.

...THERE IS COMMON AGREEMENT THAT THE WTE RESULTS IN MUCH "COSTLIER" STEAM TO PRODUCE THAN ITS ADJACENT GAS FIRED BOILER HOUSE.

One way to view the WTE is as a backup to the Boiler House. The elimination of the WTE from the equation would not require any additional capital investment to the Boiler House. A possibility would be to replace the two smaller Boiler House units with larger boilers or to retrofit the WTE boilers to burn natural gas to provide ample back up capability. Any boiler replacement or retrofitting of the WTE would clearly expand capacity beyond the already significant capacity level of the Boiler House in its present state.

6. Being in the Garbage Business. A critical issue is the continued relevance of the county being a player in the region's solid waste disposal market. The county competes head-to-head with other landfills in the area. As stated earlier, tipping fees have fallen about 50% over the past 5 years. If this facility was free standing and privately operated in its current form, it would possibly succumb in today's economic climate.

Market consolidation is happening in Western Pennsylvania. A form of vertical integration is the most recent phenomenon. Large national waste management firms are aggressively acquiring the region's landfills, transportation companies, refuse collection operators and transfer stations. At first, landfills were acquired. Then the area's major trucking companies were acquired that completed the link from curbside garbage pickup to its permanent landfill burial. There are virtually no locally owned and operated transportation companies and only a couple of large scale independent landfills left in the region.

Industry consolidation is good when efficiencies and economies of scale are realized. The potential cost savings and price reductions to end-users should be the final result. Industry professionals sense a monopoly developing and fear that prices will rise for garbage collection and landfill rates. One firm in particular effectively controls the waste business from Harrisburg to Ohio and from I-80 to the Maryland/West Virginia state line. However, interviews with key executives at USA Waste Services point out that their consolidation is driven to assure a steady stream of garbage into their landfills. USA Waste faces much competition from other landfills operated by BFI, Waste Management and several large independent landfills. Also, Ohio has tremendous landfill capacity, about equal to that of Western Pennsylvania. The consensus is that landfill rates will remain at current levels for the foreseeable future. The excess-supply more than overcomes the industry consolidation that will keep regional landfill rates about the lowest in the country.

The WTE could simultaneously benefit from and be hurt by this consolidation. If landfill rates rise through less competition, the WTE could see its tipping fee income increase from \$19 to higher levels, but not back to those experienced five years ago. On the other hand, the WTE's source of MSW could be put into jeopardy, since landfill companies own a majority of haulers. Price pressure could be exerted to the degree that only at lower than market rates or when transportation costs are lower than hauling to a landfill would these large operators use the WTE as an alternative to their own landfills. It would be very easy to run the WTE out of business, given that 75% of the MSW volume at the WTE is received from a firm that owns six of the counties nine landfills.

7. What to do with the WTE? There are strong arguments that support both sides of the fate of the WTE. On one hand, there is strong support to continue the commitment to the existence and operation of the WTE. Arguments favor basically a "business as usual"

A CRITICAL ISSUE IS THE CONTINUED RELEVANCE OF THE COUNTY BEING A PLAYER IN THE REGION'S SOLID WASTE DISPOSAL MARKET. THE COUNTY COMPETES HEAD-TO-HEAD WITH OTHER LANDFILLS IN THE AREA. AS STATED EARLIER, TIPPING FEES HAVE FALLEN ABOUT 50% OVER THE PAST 5 YEARS. IF THIS FACILITY WAS FREE STANDING AND PRIVATELY OPERATED IN ITS CURRENT FORM, IT WOULD POSSIBLY SUCCUMB IN TODAY'S ECONOMIC CLIMATE.

approach, except for seeking out ways to enhance its efficiency and financial performance. On the other hand, support exists to effectively "eliminate" the plant altogether. These range from a complete shutdown to a possible privatization of the WTE.

Financial and Operating Profile

1. WTE Tipping Intake. The theoretical capacity of the 2 incinerators combined is 50 tons per day (TPD). If run 365 days a year, this amounts to 18,250 tons. Downtime for maintenance lowers available burn days. An optimistic goal of plant managers is to operate at 80% of capacity, or 292 days per-year. Actual MSW intake for 1996 was 6,755 tons. This represents a utilization rate of 37% against full capacity and 46% against the 80% capacity level. Major waste-to-energy corporations that operate huge incinerators run at no less than 96%, 365 days a year.

The results for the January-May 1997 period show an improvement of 24% over 1996. Actual tons of MSW intake was 3,447. This is an operational level of 46% against full capacity and 57% compared to the 80% level. While this improvement is significant, it remains at around the 50% level.

2. Tipping Revenue. Tipping revenues have fallen each year since 1988, declining from \$188,405 to \$128,349 in 1996. This is a 32% drop in gross tipping revenues. Hauling contracts had not been finalized during the early years of the plant's operation and consequently, no tipping revenue was collected during the 1986-1991 period. For the first five months of 1997, it appears that tipping revenues have turned around, amounting to \$65,502 for 3,448 tons of MSW. When annualized, this is projected revenue of \$157,205 on potentially 8,275 tons (which is still less than 50% capacity.)

The decline in revenues over the past six years is attributable to three factors:

A. MSW tonnage intake and the effective tipping fees negotiated with hauling contractors vary. Each contract is negotiated separately and has varied over the years from \$6 to \$32 per ton. Granting volume discounts effectively lowers tipping rates below the official rates set by WTE management. Figure #1 below shows tipping revenue and MSW intake from 1991 to the present time.

B. The competitive nature of landfills has resulted in an inconsistent supply of MSW. Haulers switch dumping sites frequently in pursuit of even lower landfill rates as a result of pure price competition.

C. Plant down time for planned and unanticipated maintenance inhibits regular, consistent steam production.

**AN OPTIMISTIC GOAL
OF PLANT
MANAGERS IS TO
OPERATE AT 80% OF
CAPACITY, OR 292
DAYS PER YEAR.
ACTUAL MSW
INTAKE FOR 1996
WAS 6,755 TONS.
THIS REPRESENTS A
UTILIZATION RATE OF
37% AGAINST FULL
CAPACITY AND 46%
AGAINST THE 80%
CAPACITY LEVEL.
MAJOR WASTE-TO-
ENERGY
CORPORATIONS
THAT OPERATE HUGE
INCINERATORS RUN
AT NO LESS THAN
96%, 365 DAYS A
YEAR.**

Figure #1: MSW Tipping Revenue and Volume Data

Year	Tipping Revenue	Tons MSW	Total
1997 (Annualized)	\$157,205	8,275	\$19.00
1997 (January-May)	65,502	3,448	19.00
1996	128,349	6,755	19.00
1995	146,448	7,448	19.66
1994	164,607	6,109	26.94
1993	171,765	7,278	23.60
1992	188,405	9,439	19.96
1991	0	9,366	N/A

3. Comparative Cost of Steam Production. The net cost of producing steam at the WTE has been increased 15% since 1994, rising from \$13.55 to \$15.55 in 1996. This unfavorable trend is contrasted to the rising cost of steam production at the Boiler House, which has risen 13% from its low of \$5.07 in 1994 to \$5.74 in 1996. Steam produced by the WTE is 271% more expensive to produce than by the Boiler House.

This cost increase is partly due to the rising cost of natural gas. The national average price of natural gas as reported by the Energy Information Administration has increased steadily rising 15% from \$4.63 (\$/mcf) in 1987 to \$5.88 (\$/mcf) in 1996. The rising cost of natural gas has affected both facilities equally, since they are both heavy users of gas. The Boiler House uses it to heat the boilers. The WTE uses it to ignite the MSW, supplement the incineration process and to maintain the boilers at a minimum 1,700 degrees dictated by DEP permits.

The portion of natural gas costs classified as "Other Services" for the WTE for have risen from 12% in 1994 to a high of 32% in 1995. They have subsequently fallen to 31% and 20% for 1996 and 1997, respectively. This favorable trend is mainly due to the improved capacity utilization of the incinerators, maintenance improvements and a non-interruptible gas purchase arrangement through a buying consortium. Figure #2 below shows comparative steam costs for both facilities. Costs per unit are based on the quantity of steam delivered to customers and net of tipping revenue for the WTE.

THE NET COST OF PRODUCING STEAM AT THE WTE HAS BEEN INCREASED 15% SINCE 1994, RISING FROM \$13.55 TO \$15.55 IN 1996. THIS UNFAVORABLE TREND IS CONTRASTED TO THE RISING COST OF STEAM PRODUCTION AT THE BOILER HOUSE, WHICH HAS RISEN 13%...STEAM PRODUCED BY THE WTE IS 271% MORE EXPENSIVE TO PRODUCE THAN BY THE BOILER HOUSE.

**Figure #2: WTE and Boiler House Facilities
Cost Per Unit (1000 lbs.) of Steam: 1994 to 1997**

	WTE Costs	Tipping & ACT 101 Rev	Net WTE Costs	WTE Steam Sold	WTE Unit Cost	BH Costs	H Steam Sold	BH Unit Cost
1997*	324,233	70,326	253,907	15,805	16.06	290,985	38,694	7.52
1996	776,794	148,615	628,179	40,406	15.55	478,606	83,447	5.74
1995	725,619	169,691	555,928	34,756	16.00	422,269	77,584	5.44
1994	697,312	189,532	507,780	37,488	13.55	482,423	95,219	5.07

* For the period January-May 1997 only.

Depreciation expense was omitted from the table above because of the controversy surrounding its inclusion. Depreciation is a valid expense, and capital costs should be included even when the funds are obtained from grants because a capital replacement fund should be established. The WTE capital investment is booked at slightly over \$4 million. Given the high cost differential between the two steam production facilities, a vivid contrast can be obtained without its inclusion at this time. Depreciation per unit of steam calculated by the county controller's office for the WTE amounted to \$7.74 in 1994 and \$6.72 in 1995 raising costs to \$21.29 and \$22.725 respectively. No similar depreciation costs were reported for the Boiler House.

4. Steam Revenues. Steam is sold to three outside customers, in addition to the Westmoreland Manor, at the rate of \$14.45/unit. Controversy surrounds the value of steam sold to the Manor. The county jail, state prison and Hi-Rise pay \$14.45, where as steam used by the Manor was booked on its "reimbursement" amount from PA Medical Assistance. This discrepancy is significant. For example, the Manor used 47,777 units of steam in 1995. The Manor's MA reimbursement was \$279,892 for out-of-pocket costs and \$244,071 for depreciation. This equates to \$10.97/Unit (\$5.86 + \$5.11.) This value is \$3.48 or 24% below the rate paid by the other three users.

On July 1, 1997, the Manor becomes a paying customer at the \$14.45 rate. The effect of shifting the WTE and Boiler House to the Department of Public Works serves to increase revenues to the Manor by the differential between the cost reimbursements and the quoted price of steam for the others. For 1995, this would have increased Manor revenues by \$166,106.

Possible Options

1. Business as Usual. Upon transfer to the Public Works Department, the WTE and Boiler House could continue as they have in the past: accepting MSW and selling steam to four customers. The WTE would continue to run side-by-side with the Boiler House each producing steam. The greater revenues from the Manor (MA reimbursements) could make the steam operations profitable on paper. Maintenance activities and capital improvements would progress forward that should improve efficiencies somewhat and strive to enhance the existing equipment configuration.

The theme of "business as usual" means that small progress will be made over time to enhance tipping fees and incinerator run time. Capital funds will be needed to replace aging equipment. In need of immediate attention is an ash conveyor system on the #1 incinerator. Its estimated replacement cost is \$100,000. The majority of the plant is the original equipment now about 10 years old. Capital funds will be needed within 1-2 years to replace the tubing within the plant requiring at least another \$100,000 commitment. At issue is the prudence of making a larger financial commitment to this operation.

Several efficiency improvements are under consideration by WTE management. A shredder could be installed that would "pre-process" the MSW into a better consistency and composition. The goal would be to get a better burn at higher temperatures, which requires less natural gas and reduces bottom ash residual waste. Another improvement would be to dry the bottom ash before it is dumped into the collection container. The plant has to pay \$26 per ton to dispose of bottom ash. The disposal cost could possibly be reduced by eliminating much of the weight attributable to the water in the bottom ash

THE MAJORITY OF THE PLANT IS THE ORIGINAL EQUIPMENT NOW ABOUT 10 YEARS OLD. CAPITAL FUNDS WILL BE NEEDED WITHIN 1-2 YEARS TO REPLACE THE TUBING WITHIN THE PLANT REQUIRING AT LEAST ANOTHER \$100,000 COMMITMENT. AT ISSUE IS THE PRUDENCE OF MAKING A LARGER FINANCIAL COMMITMENT TO THIS OPERATION.

coming out of the "ash quench." Both of these modifications would have to be specially engineered and would cost several hundred thousand dollars.

It is ironic that the WTE charges \$19 per ton for its incoming material, but pays \$26 per ton to dispose of the plants own waste material. Bottom ash residual has historically averaged 30% of the raw garbage being burned. The ash disposal cost lowers the effective tipping fee by \$7.80, to only \$11.20 at the 30% level and to \$15.20 at the 15% residual level.

It is entirely possible that the four capital improvements cited above would require an additional \$500,000 investment. Unknown at this time is the true cost savings derived from this investment. The two replacement projects will not yield any cost savings. It is doubtful that the two capital improvements (shredder and ash dryer) would lower operating costs. A fact in the waste-to energy business is that every time garbage is handled, operating costs rise. The O&M and capital costs are already very high. The cost differential between the two facilities is so great that proposed efficiency improvements would be minute in comparison to this cost disparity.

A shredder is a very dangerous and expensive piece of equipment to operate. The risk of explosion is tremendous. A shredder must be housed in an "explosive proof" bunker for the protection of plant personnel and existing equipment. The force of the hammers in a shredder could cause a major explosion from debris as small as a propane torch canister. It is also a major maintenance problem. Industry estimates call for expected downtime for repairs to occur every two weeks. The addition of a shredder, while good in principle, is a hazard not only to the safety of employees but to the operating budget of the plant.

2. Alternative Fuels Other than Garbage. Another fuel source could be identified to burn besides MSW. A problem now with municipal solid waste is the low BTU factor. The plant does not operate at the heat levels assumed in the original design. The lower BTU results in operating problems and high maintenance.

Several alternatives have been identified as potential fuel sources that could have a better consistency and generate higher heat values:

- Crushed wool pallets.
- Shredded newsprint.
- Construction materials.
- Chipped tires.

The WTE has obtained Department of Environmental Protection approval that relaxes permit guidelines to allow for "test burns" in a controlled setting. To convert over to an alternate fuel, the county would have to do the following:

- a. Determine the necessary modifications to the physical plant.
- b. Obtain Department of Environmental Protection approval.
- c. Determine a steady source of raw fuel supply.
- d. Produce a financial projection of revenues and expenses.
- e. Invest additional capital funds to the WTE facility.

...IN THE WASTE-TO ENERGY BUSINESS IS THAT EVERY TIME GARBAGE IS HANDLED, OPERATING COSTS RISE. THE O&M AND CAPITAL COSTS ARE ALREADY VERY HIGH. THE COST DIFFERENTIAL BETWEEN THE TWO FACILITIES IS SO GREAT THAT PROPOSED EFFICIENCY IMPROVEMENTS WOULD BE MINUTE IN COMPARISON TO THIS COST DISPARITY.

The issue is the long-term viability of these fuel sources, market value of steam, engineering and capital costs to retrofit the plant for an alternative fuel source. Similar to the issues cited above, a shredder is a hazardous piece of machinery and would be necessary. While tires are a possibility, this would be the most costly and problematic. Every tire contains the equivalent of 2.5 gallons of oil when burned. This volatile by-product is uniquely difficult to handle safely and cost effectively. The higher level of emissions is a problem. Incinerated tires give off high volumes of sulfur dioxide, so extensive scrubbers are required. The steel bands in the tires are destructive to the shredder and elevate the O&M costs of the system. Any decision to use fuel other than MSW must consider both the capital investments to modify the plant and also the impact on maintenance/operating costs.

3. Privatize the WTE Plant. The economic reasoning for a private company to acquire or operate the facility does not exist. The plant size is too small for it to ever be financially viable. In the words of a senior engineer for the largest waste-to-energy firm in the nation, "it's a toy." The large national firms would not commit time or resources to become involved with such a tiny operation. The WTE's 50 tons per day (18,250 annually) is insignificant. In contrast, the smallest plant operated by American Ref-Fuel is 350,000 tons per year. Their typical plant consumes 1.1 million tons of MSW annually.

An entrepreneur would be unlikely to enter into a venture as risky as this plant. Three reasons are cited that would make privatization infeasible:

1. Operating costs are too high and can not be effectively lowered to a profitable level. The current cost structure exceeds the selling price of steam. The cost structure and economies of scale of different size waste-to-energy facilities is not linear but are in fact geometric in proportion. Small plants are burdened by a heavy fixed cost structure that can not be offset due to their small revenue potential. Capital costs would require a continual investment of hard dollars that would be beyond the means of an independent operator.

2. The MSW fuel source is unreliable in our area. According to industry experts, Western Pennsylvania is known as the "Landfill Capital of the World." There is more landfill space in our region than anywhere in the nation. This abundance of landfill space will keep landfill rates significantly below those nationally for decades to come. A proposed privatization deal in York, PA fell through for a plant 50 times larger than Westmoreland County's for the simple reason it was located too close to the Western PA landfills.

3. The steam revenue is highly unreliable from an entrepreneur's standpoint. The national average price for steam is \$4-5.50 per 1000 pounds. The county's steam rate of \$14.45 is triple the market rate. The only commercial steam company in Pittsburgh sells steam at \$10 per 1000 pounds. Once the plant would be in the hands of private ownership, this "above market" contract for \$14.45 steam would be at risk. Steam prices would most likely be forced down to an economically justifiable market price.

This revenue risk is a real possibility and is already happening. The state prison at Greensburg has balked at their steam cost for several years and has routinely threatened to install their own boiler house. The WTE/Boiler House complex was visited recently by engineering consultants from the Penn State University Energy Engineering Institute.

**THE ECONOMICS OF
A PRIVATE COMPANY
ACQUIRING OR
OPERATING THE
FACILITY DO NOT
EXIST. THE PLANT
SIZE IS TOO SMALL
FOR IT TO EVER BE
ECONOMICALLY
VIABLE. IN THE
WORDS OF A SENIOR
ENGINEER FOR THE
LARGEST WASTE-TO-
ENERGY FIRM IN
THE NATION,
"IT'S A TOY."**

They have been hired by the State to study energy costs of the Correctional System's 25 state prisons, particularly the Greensburg Prison. They indicated that steam costs at the other 24 correctional facilities range from \$4-8 per 1000 pounds and that the Greensburg facility pays the highest rate in the state for its steam. They are particularly focused on lowering the cost structure at the Prison, which is the County's second largest customer.

For example, the Prison purchased 33,948 units of steam in 1996 and 37,115 units in 1995. An "in-house" gas fired boiler can produce steam in the \$5-7 range. Cost savings of \$8.45 (\$14.45-\$6) would have yielded the State \$286,860 in 1996 and \$313,622 in 1995. Cost savings of this magnitude would pay back its capital investment in 1-2 years at the most. For these reasons (abundant land fill capacity in the area, "over market" steam contracts and high O&M/capital costs), the WTE does not represent a viable privatization initiative.

4. Shut Down the Facility. A long and exhaustive examination of the WTE has yielded several insights. The evaluation of the advantages and disadvantages has been particularly focused on an objective and unbiased assessment of the future value of the WTE. Throughout this study, it has been shown that the personnel at the WTE are committed to improving the plant's efficiency. They are a talented and dedicated staff, and they deserve praise for doing the best they can to make the WTE a success. The WTE staff has a track record of persistence and creativity in their struggle to improve upon the plants operating performance.

But the hard reality is that this plant would never be built in today's economic environment. Its small size alone is enough to seal its fate. Industry experts surveyed express that its economic viability would be doubtful even if the WTE were located in a high-priced market like Long Island, NY. On top of this are the "artificial economics" of its over-market steam sales. Nowhere in the country, except Westmoreland County, can steam be sold at double to triple its economic value. A captive market has shielded the WTE from the realities of the market place. The plant will never be able to produce steam at a cost commensurate with its value in a free market sense.

Reasons to Shut Down the WTE Plant

A. The future value of steam sales will fall as the State Prison most likely will find an alternative source. Any lost revenue will simply magnify the WTE plant's financial losses. A price reduction large enough to keep the Prison as a customer would probably cut steam sales revenue in half. All of the plant's four customers would enjoy the price reduction. This too would further increase the plant's losses. Steam revenue at 1996 production levels would fall from \$596,000 to \$298,000 for the WTE alone. This loss of \$300,000 would kill the plant immediately. Any loss of customers or price reduction would also hurt the Boiler House financial profile. The loss of the Prison would cost the County about \$500,000 in annual revenue. A drastic price reduction to competitive rates, in an effort to keep the Prison as a customer, would cost the County about \$895,000, or half of its \$1,790,000 steam revenue earned in 1996.

B. A continuing struggle to preserve the WTE will consume hundreds of thousands of dollars. The small size of the plant makes these efforts hopeless. The high O&M costs are fixed in nature. Nothing short of a miracle can lower steam production costs below their

**...THE HARD REALITY
IS THAT THIS PLANT
WOULD NEVER BE
BUILT IN TODAY'S
ECONOMIC
ENVIRONMENT. ITS
SMALL SIZE ALONE
IS ENOUGH TO SEAL
ITS FATE...THE
PLANT WILL NEVER
BE ABLE TO
PRODUCE STEAM
AT A COST
COMMENSURATE
WITH ITS VALUE IN A
FREE MARKET
SENSE.**

present level. The irony that additional material handling to improve efficiencies on one hand only lead to higher costs on the other that make such tradeoffs unjustifiable.

C. The worst market in the country to locate a waste-to-energy facility is in Westmoreland County. Landfill rates will likely remain some of the lowest in the nation for the indefinite future. The consolidation of the region's MSW industry through vertical integration of collection-hauling-landfill operations will not produce the consistent supply of raw fuel or price increases sufficient to sustain the WTE.

D. The Boiler House expanded its capacity with the addition of two new boilers when the State Prison was constructed. The Boiler House has ample capacity alone to service all four customers. The WTE generates at best 30% of the steam production. Since steam usage is relatively fixed in volume, any additional steam generation by the WTE would result in higher lost steam ratios or running the Boiler House at less than its optimal capacity. It makes little sense to struggle to generate high cost steam at the WTE at the cost of NOT producing \$6 steam at the Boiler House.

An investment of roughly \$100,000 would be sufficient to retrofit the WTE with gas fired "package boilers." This conversion from MSW to fossil fuel would provide additional boiler capacity during peak demand periods and for maintenance shut downs of the other boilers. An engineering study would have to be conducted to determine if it is better to retro-fit the WTE for gas or to abandon the WTE and add one or two boilers to the Boiler House.

E. Significant cost savings to the county would be realized immediately with a WTE shutdown. The WTE had total costs of \$777,000 in 1996 and \$726,000 in 1995. These costs are unnecessary since productive capacity and steam sales can be met with the present Boiler House. Tipping and ACT 101 fees would result in lost revenue of \$148,000 netting an overall cost saving of about \$630,000. This does not count the avoidance of planned capital investment at the WTE within the next 12 months.

Reasons Not to Shut Down the WTE Plant

A. Maintain the commitment to an experimental project for political or non-financial reasons. The WTE is a technological and financial quagmire. By today's standards, this waste-to-energy facility would never be constructed. The continued support serves to protect the decision ownership at the cost of financial prudence and good stewardship.

B. Invest larger amounts of capital into potential efficiency improvements to try to compete in the MSW business against overwhelming odds.

***THE WORST MARKET
IN THE COUNTRY TO
LOCATE A WASTE-
TO-ENERGY FACILITY
IS RIGHT HERE IN
WESTMORELAND
COUNTY...
SIGNIFICANT COST
SAVINGS TO THE
COUNTY WOULD BE
REALIZED
IMMEDIATELY WITH A
WTE SHUTDOWN.***

C. Continue to charge customers over-market prices for steam while the County can still get away with it. All four customers are funded by taxpayers from the federal, state or local levels. Regardless of whom it is, the taxpayers bear the ultimate burden of the unnecessary costs associated with the WTE. The continued operation of the WTE is in direct conflict with the new realities of heavy tax burden, governmental efficiencies and accountability to the taxpayers that are the ultimate stakeholders.

...TAXPAYERS BEAR THE ULTIMATE BURDEN OF THE UNNECESSARY COSTS ASSOCIATED WITH THE WTE. THE CONTINUED OPERATION OF THE WTE IS IN DIRECT CONFLICT WITH THE NEW REALITIES...

Scenario Analysis

The following five scenarios have been developed to identify the impact on County government and County taxpayers of a shutdown decision of the WTE. The critical focus is on the costs and benefits between continuing business as usual and closing or retrofitting the WTE to burn natural gas. For each scenario, a "net benefit" is calculated that dramatizes the financial impact of various decision alternatives.

Scenario #1					
Selling price for steam remains at \$14.45					
Both steam plants remain operational.					
(This is a restatement of 1996 data into a scenario format.)					
Revenue Breakdown By Steam Production Facility					
	Steam Units Produced	Delivery Ratio	Steam Units Sold		
WTE	48,049	0.841	40,409		
Boiler House	99,223	0.841	83,447		
	147,272		123,856	<-- 1996 Units Sold	
			x \$14.45	<-- Price Per Unit	
			\$ 1,789,716	<-- 1996 Revenue	
Cost of Production Breakdown by Steam Facility					
	Steam Units Sold	Gross Operating Costs	Less: Tipping and ACT 101 Fee's	Net Operating Costs	Cost Per Unit of Steam Sold
WTE	40,409	\$ 776,794	\$ 148,615	\$ 628,179	\$15.55
Boiler House	83,447	\$ 478,607	-	\$ 478,607	\$5.74
Total	123,856	\$1,255,401	\$ 148,615	\$1,106,786	\$8.94
				1996 Recap	
Steam Revenue				\$1,789,716	
Cost of Steam Production				(1,106,786)	
Steam Operations Profit				682,930	
Less: County Jail Charges From "Over Market" Steam				(163,862)	
Net Benefit to the County				\$ 519,068	
Memorandum:					
1. WTE steam costs \$15.55/unit net of garbage related fees and exclusive of depreciation.					
2. Boiler House steam costs \$5.74/unit exclusive of depreciation.					
3. County Jail revenue is overstated by \$6.45/Unit (\$14.45 - 8.00) which is a paper profit for the WTE but a "wash" transaction for the County as a whole.					
4. The County Jail purchased 25,405 units of steam for book revenue of \$367,102.					

Scenario #1 simply restates financial reporting data from Westmoreland County into a scenario format for analytical purposes. The costs per unit of steam for both facilities are recalculated. The apparent steam operations profit for 1996 is effectively reduced by an amount to reflect the negative impact on the County Jails budget from the high price of steam benefiting the WTE/Boiler House complex.

Scenario #2					
Same level of steam production as 1996.					
Steam is sold at \$14.45 per unit.					
The customer base remains the same as 1996 (Jail, Prison, Manor and Hi Rise.)					
The WTE is shut down.					
1996 Steam Sales @ \$14.45/unit				\$ 1,789,677	
1996 units of steam sold:		123,856			
Times - Cost of steam at Boiler House rate:		x \$5.74			
Total Cost of Steam Produced:				\$ 710,932	
Net Operating Profit from Boiler House Only Operation				\$ 1,078,745	
Incremental Profit to the County from WTE Shut Down:					
Profit without WTE operating				\$ 1,078,745	
Profit with WTE operating				682,890	
Increased Profit by operating the Boiler House only				\$ 395,855	
Memorandum:					
1. Revenues for 1996 remain the same, while the cost structure falls from the shut down of the WTE.					
2. Profits increase to the County as low cost steam replaces high cost steam resulting in higher profit margins.					
3. The County would realize a larger profit by \$395,855 due to the shut down of the WTE.					
4. The \$395,855 is an opportunity cost to the County represented by the lost profits from operating					

Scenario #2 assumes the WTE is shut down and all steam is produced in the Boiler House facility at the current Boiler House cost structure. Overall steam profits increase by \$395,855 is results from high cost steam of the WTE being replaced with lower cost steam from the Boiler House. All of which are still sold to customers at \$14.45. The \$395,855 is the effective "benefit" to the county and taxpayers of a shutdown of the WTE.

Scenario #3							
State Prison stops buying steam and finds an alternative source.							
The WTE stays in operation.							
The steam price remains at \$14.45/unit.							
	Units Produced	Pro Rated Lost Production	Net Steam Unit Sales	Net Steam Revenue			
WTE	40,409	(11,076)	29,333	\$ 423,863			
Boiler House	83,446	(22,872)	60,574	\$ 875,293			
Total	123,855	(33,948)	89,907	\$ 1,299,156			
WTE	Cost/Unit	\$15.55	29,333	\$ 455,996			
Boiler House	Cost/Unit	\$5.74	60,574	\$ 347,421			
			Total Cost	\$ 803,417			
Steam Operations Profit				\$ 495,739			
Less: County Jail "over payment" for high priced steam				\$ (163,862)			
Net benefit to the County overall				\$ 331,877			
Memorandum:							
1. If the Prison leaves, profits would fall by \$187,151 compared to Scenario #1 (\$682,890 vs. \$495,739.)							
2. The County 's loss of \$187,151 reflects that while lost revenue from the Prison is \$490,549, a cost savings of \$303,398 from NOT producing steam would be realized.							
3. The State Prison purchased 33,948 units of steam in 1996.							
4. The WTE produced 33% of the steam and the Boiler House produced 67% of all steam generated.							
5. Net profit is overstated by \$163,842 from the Jail being charged over market rates for steam that burdens the Jail's budget and favors the steam generating plants reported profitability.							

Scenario #3 assumes the State Prison finds an alternative steam source and all other variables remain the same as the present time. Steam profits to the county fall as the county loses its second largest steam customer.

Scenario #4							
The Prison leaves as a customer.							
The WTE shuts down.							
The steam price remains at \$14.45							
Units of steam sold including the Prison			123,855				
Lost steam sales - Prison			(33,948)				
Net steam units sold w/o Prison			89,907				
				Revenues			
Steam Revenue	\$14.45		89,907	\$ 1,299,156			
Steam Costs - BH Only	\$5.74		89,907	515,661			
	Steam profit before Jail adjustment			783,495			
	Less: Jail overcharges on steam			(163,862)			
	Net benefit from steam operations			\$ 619,633			
Memorandum:							
1. Operating profit would be \$100,605 higher than the present time when both the State Prison							
is a customer and the WTE remains open.							
2. All production costs are at the Boiler House level of \$5.74 per unit.							
3. Operating profit would be \$287,756 higher than scenario #3 in which the Prison leaves							
and the WTE remains operational.							

Scenario #4 considers the shutdown of the WTE at the same time the State Prison ceases to be a steam customer. The elimination of the high cost steam of the WTE results in steam operations profit of 783,495. This value is \$287,756 higher than Scenario #3. This higher amount is the incremental benefit of shutting down the WTE.

Scenario #5							
Customers force the selling price of steam down to a cost-plus of \$8 or \$9 per unit of steam.							
Option #A	Prison stays on as a customer at the \$8, \$9 or a \$10 price; The WTE shuts down.						
	Units Sold	Unit Price	\$8 Price	Unit Price	\$9 Price	Unit Price	\$10 Price
Steam Revenue	123,855	\$8.00	\$ 990,840	\$9.00	\$ 1,114,695	\$10.00	\$ 1,238,550
Steam Cost	123,855	\$5.74	\$ 710,928	\$5.74	\$ 710,928	\$5.74	\$ 710,928
		Profit	\$ 279,912		\$ 403,767		\$ 527,622
Option #B	Prison stays on as a customer; and the WTE remains operational.						
Steam Revenue	123,855	\$8.00	\$ 990,840	\$9.00	\$ 1,114,695	\$10.00	\$ 1,238,550
WTE Costs	40,409	\$15.55	\$ (628,176)	\$15.55	\$ (628,176)	\$15.55	\$ (628,176)
Boiler House Costs	83,446	\$5.74	\$ (478,604)	\$5.74	\$ (478,604)	\$5.74	\$ (478,604)
Total Costs			\$ (1,106,780)		\$ (1,106,780)		\$ (1,106,780)
		Profit (Loss)	\$ (115,940)		\$ 7,915		\$ 131,770
Overall difference of the WTE being open or closed			\$ 395,852		\$ 395,852		\$ 395,852
Memorandum:							
1. The impact between the WTE remaining open and shutting down at either the \$8, \$9 or \$10 lower price is a difference of \$395,852.							
2. This value of \$395,852 is almost equal to the benefit to the County under Scenario #2, where everything stays the same except the WTE shuts down.							
3. The county is more favorably impacted by the price reduction due to the County Jail's budget savings from lower cost steam.							
Sensitivity Analysis:							
1. Tipping fees would have to rise to \$36.16 for steam operations to breakeven from the (\$115,940) loss level.							
2. Tipping fees would have to rise to \$77.60 for steam operations to breakeven at the "shut down" benefit level of \$395,855.							

Scenario #5 assumes a reduced selling price for steam to reflect the market value of commercial steam. The overall benefit to the county for closing the WTE is again roughly \$400,000. This is a similar value to in Scenario #2. This benefit originates from the same level of steam production, but the low cost facility replaces the high cost facility. The interesting thing is that at any selling price of steam below \$14.45 the savings to the county remains unchanged. This is because the benefit of shutting down the WTE arises from the cost differential between the two facilities. The same quantity of steam will be produced and sold whether the county operates one facility or two facilities.

Because the WTE costs almost three times as much to produce, yet sells for the same price as Boiler House steam, the county loses almost \$10 on every unit of steam produced by the WTE.

Policy Recommendation

Four alternative solutions have been proposed. The first three alternatives (substitute fuels, business-as-usual and privatization) are rejected for basically the same reasons: the inefficiencies and high cost associated with such a small size plant, very low land fill rates because the plant is located in the "landfill capital of the world", and the inherent subsidy from the "over-market" steam contracts. These three conditions are enormous obstacles to overcome, each of which alone is enough to doom the WTE to failure. They are deep-seated problems that are relatively permanent in nature. The prospect of a turnaround against such overwhelming odds is wishful thinking at best and foolishness at worst.

The responsible course of action is to shut down the WTE. The cost differential between both steam facilities and the unneeded capacity of the WTE are sufficient cause for elimination. The financial benefit of closure is about \$400,000 by conservative estimates. The scenarios cited above detail the revenues and costs under various courses of unfolding events.

The justification for the WTE remaining in operation could be based on political as well as financial criteria. Undoubtedly some employees could lose their jobs. This is always unpleasant and adequate measures should be taken to make a smooth transition.

Hoped for efficiency gains or a return to substantially higher tipping fees are extremely unlikely to be fulfilled. Thus, the commitment to continue the WTE experiment is not adequate grounds for operating the WTE at considerable expense to county taxpayers.

The savings from closing the WTE could be absorbed into the general budget or redirected to some other politically acceptable area. For example, all or part of the savings could be devoted to economic development projects that could ultimately soften the blow from the fallout of a shutdown decision.

Overall, an objective analysis of the costs and benefits of the WTE overwhelming suggests shutting down the WTE facility.

***THE ONLY
REMAINING COURSE
OF ACTION IS TO
SHUT DOWN THE
WTE. THE COST
DIFFERENTIAL
BETWEEN BOTH
STEAM FACILITIES
AND THE UNNEEDED
CAPACITY OF THE
WTE ARE
SUFFICIENT CAUSE
FOR ELIMINATION.
THE FINANCIAL
BENEFIT OF
CLOSURE IS ABOUT
\$400,000 BY
CONSERVATIVE
ESTIMATES.***

Appendix

Figure #1
January-May 1997 WTE and Boiler House Cost Breakdowns

Cost Component	WTE	WTE %	Boiler House	Boiler House %	Total Costs
Wages	95,438	97.4%	2,563	2.6%	98,001
Benefits	25,907	92.8%	2,009	7.2%	27,916
Other Services	154,684	40%	231,813	60%	386,497
Supplies	1,717	59.6%	1,166	40.4%	2,883
Other Operating	46,487	46.5%	53,434	53.5%	99,921
Total Costs	324,233	52.7%	290,985	47.3%	615,218

Figure #2
January-December 1996 WTE and Boiler House Cost Breakdowns

Cost Component	WTE	WTE %	Boiler House	Boiler House %	Total Costs
Wages	232310	89%	28220	11%	260531
Benefits	64370	90%	7249	10%	71619
Other Services	478412	52%	436367	48%	914779
Supplies	1702	20%	6769	80%	8471
Total Costs	776794	62%	478606	38%	1255401

Figure #3
January-December 1995 WTE and Boiler House Cost Breakdowns

Cost Component	WTE	WTE %	Boiler House	Boiler House %	Total Costs
Wages	223185	90%	25595	10%	248780
Benefits	55331	90%	6282	10%	61613
Other Services	442689	54%	383623	46%	826311
Supplies	4415	39%	6769	61%	11184
Total Costs	725619	63%	422269	37%	1147888