An Overview of

REFUSE DISPOSAL

and

RESOURCE RECOVERY

in New York City

Issues and New Directions

DEPARTMENT OF SANITATION
THE CITY OF NEW YORK

MARCH, 1979

"Let everyone sweep in front
of his own door, and the whole
world will be clean."

____Goethe

FOREWORD

In recent months, the Department of Sanitation and the Office of the Mayor have been deluged with requests for information on the City's waste disposal system and its future plans for resource recovery, in which new facilities will be constructed to recover useful materials and energy from solid waste. These requests are coming from many segments of society, including: public officials, the newsmedia, community, civic and environmental organizations, universities, foundations, resource recovery firms, engineering, environmental and management consultants, and average New Yorkers.

In response to this unprecedented public interest in garbage disposal and resource recovery, this report has been drafted. It attempts to answer most questions people have in this area.

In addition, the report outlines the new directions this Administration will pursue.

Social and legal pressures to change our methods of solid waste disposal are acute, and are justified. Environmental objections to present disposal methods increase continually, and the physical capacity of our existing landfills is limited.

It is against this background of urgency that the City addresses the future disposal and collection operations of the Department of Sanitation and proceeds on implementation of resource recovery facilities.

In past years a number of planning documents have been prepared by City staff and by professional consultants. While those plans have had some value in providing an over-view of the state of the art at the time they were researched, they, like many master plans, tended to be outdated even before they were printed in final form. Particularly in a field of developing technologies, master planning is of questionable value. After a review of these plans, the direction taken by prior administrations and an assessment of the actions required to pursue resource recovery in the City, we have chosen what can be characterized as an implementation strategy.

We have made the judgment, given the urgency of our need to put alternative disposal methods in place, the developmental nature of resource recovery technology and the considerable expertise required to put together even one project, that the City should proceed on implementation of a first facility.

Funding has been identified, from the U.S. Department of Energy to enable us to hire the consultants we believe necessary to assist us in preparing the Request for Proposals (RFP) for a first facility and contracts for these consultants have been approved by the Board of Estimate.

The process of developing this first RFP will include deriving information necessary to make a series of inter-related and fairly complex decisions. We must find a site for the plant. We must resolve a series of legal, financial and technological issues and structure a project that will result in a facility that will be technologically reliable, that will provide disposal services

at a price the City can afford, and that will be financed in the private market.

We must structure a project that protects us against considerable financial risk - - risk that the City will be contractually bound to pay a price it cannot afford over time, or a price which is too high for the services it is receiving, and risk that the project, after considerable planning, will not be financed. We must protect against technological risk as well - - risk that the plant will not work, that the energy will not be sold, that evenironmental standards will not be met, that delays in starting operation will increase costs or create a disposal crisis.

We must recognize that the contractual process leading to procurement of resource recovery facilities is complex, demanding and far-reaching, culminating in commitments extending far into the future. The final legal instruments or contracts must explicitly formulate a policy of risk management that identifies, reduces and allocates all the major risks associated with the project. Risk analysis requires that the project team confront a number of basic questions: What are the sources of risks? What are their consequences? What is the likelihood or probability of an undesirable situation or event developing as a result of a particular risk? Who is best able to reduce that risk? What mechanism can be utilized to share or allocate risk among project participants?

Specifically, resource recovery project directors must formulate risk management strategies to minimize the impact of the following possibilities:

1. Changes in waste tonnage and waste composition.

2. Increases in the capital required to construct and bring on-stream a functioning plant, as a result of delays in receiving permits, delivery of equipment, inflation, strikes, sub-system problems, and other factors.

3. Escalation of tipping or dump fees caused by inflation of operating and maintenance costs, inappropriate rules for escalating fees, and just plain poor management and operation of the facility.

4. Excessive downtime due to system breakdowns or failure to meet environmental codes and/or inability to produce materials and energy of acceptable quality or in sufficient quantity, resulting in reduced project revenues from the sale of products and the need to landfill the material.

5. Catastrophic events such as explosions, fires, strikes, storms, and sabotage.

6. Fluctuations in the market value of recovered materials and energy or loss of markets altogether.

7. Promulgation of new environmental regulations requiring additional capital investment and increased operating and maintenance costs.

8. Emergence of new products derivable from solid waste and the sharing of revenues therefrom.

9. Inability to dispose of non-recoverable components of solid waste (residuals) on a long term basis.

Any of these risks can affect our ability to dispose of our solid waste efficiently and reliably and/or necessitate increased cost to the City. In regard to the latter, there are resource recovery facilities in operation in the United States with a spread in tipping or disposal fees from $10 per ton to over $20 per ton. For the City's 20,000 tons per day of processable waste, this could represent a difference in outlay of funds on the order of $1.2 billion over a twenty year period. Clearly, there is much at stake and our approach must reflect the vast sums of public monies and commitments at issue.

A master plan will not help us resolve these issues which must be addressed before any facility can be built. Studying the problem yet again, as a theoretical matter, will not bring us closer to averting a crisis in waste disposal.

Resource recovery represents a new field in public administration. These projects, in most cases, are essentially business ventures in which government is in partnership with industry. Because of the lack of experience on both sides, the aggregated risk is substantial. But experience is best acquired by proceeding with project implementation. That is the only way the basic texture and substance of the discipline can be understood, and how the essential planning, analytical, project management, and evaluation skills can be learned and sharpened.

The City team must acquire these skills to manage our resource recovery program, and we propose to accomplish that goal by means of

our first project. The management, technical legal, and financial consultants we have retained will play a large part in that process and also insure that the project we develop is responsible, viable and cost-effective.

We do recognize that one facility is far from enough. We cannot expect that it will account for disposal of more than the maximum of 4,000 of the 22,000 tons a day we presently incinerate and landfill. Thus, a series of projects will be required.

Consequently, we are seeking funding from the U.S. Environmental Protection Agency for a project implementation in conjunction with the Port Authority of New York and New Jersey, the Power Authority of the State of New York and the Urban Development Corporation for a second resource recovery facility. We believe that a cooperative effort of this sort will allow us to explore resource recovery's potential as a tool for economic development in addition to providing us with a pool of technical, management and financial resources.

Simultaneously, the Port Authority is seeking funding from USEPA, with our support, to begin implementation work on resource recovery in the context of industrial parks, pursuant to the authorizing legislation recently passed in Albany. A third facility in the City of New York is expected to result from this work.

Being cognizant of the sensitive nature of site selection, we will try hard to recommend locating facilities among the boroughs so that each pulls its own weight, i.e. each borough must accept the siting of facilities with sufficient capacity to dispose

of the waste it generates. The pessimists would call this an equitable sharing of pain; the economic development optimists, an equal sharing of opportunity. Unique market opportunities may modify this somewhat, but we consider this an overall guiding principle in the site selection process. We are prepared to work cooperatively with the Borough Presidents, other elected officials, and community groups in this extremly important area.

It is clear from the above that the City Administration is fully committed to moving ahead with implementation of a series of resource recovery projects.

We view resource recovery as a three-way solution for the City of New York. It is a solution to our difficult problem of solid waste disposal; it is a solution to environmental problems which our present waste disposal methods have created; and it potentially is a partial solution to the flight of industry from the City of New York and to the resulting economic distress of the City.

While we are therefore making considerable strides in implementing resource recovery facilities in the City, we recognize that considerable work remains to be done. One purpose of this report, therefore, is to set forth many of the issues remaining to be addressed and what we propose to do to understand them. We recognize the importance of insuring that any series of projects be consistent with the overall needs of the City for waste collection and disposal and are sensitive to their potential impact on the environment, the economy, and the cost of energy that resource recovery might have.

To perform the work necessary and to insure that this consistency is achieved, this report delineates the various issues and identifies a number of approaches. The report must be taken as a working document, an outline of what we can see now, with the understanding that, as our knowledge and experience increases, our perception of the issues will almost certainly change.

NORMAN STEISEL
COMMISSIONER
DEPARTMENT OF SANITATION

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1.0 A STATEMENT OF MAJOR ISSUES

In the transition from the present waste disposal methods to upgraded or new conventional facilities and to resource recovery facilities a number of important issues must be addressed. These include a consideration of compatibility with present and future disposal and collection operations, opportunities for economic development, the question of co-disposal of solid waste and sewage sludge, institutional relationships, and legal constraints. Each of these areas will be briefly discussed. Subsequent sections will elaborate on these questions and outline possible approaches to their resolution.

1.1 Resource Recovery and Present Disposal Methods

Resource recovery must be understood in the context of present disposal methods of the Department of Sanitation as one of a number of alternatives to those methods. Among the issues to resolved in this area are:

1. The capacity of existing landfills and the change in projected termination dates which will be caused by:

    a. reduction of volume due to resource recovery implementation;

    b. the City's ability to comply with existing or future regulations.

2. The technological availability and economic and social costs of upgrading existing landfills to meet environmental standards.

3. The extent of future need for landfilling as a

continuing disposal method for untreated waste, as backup to resource recovery facilities, and as disposal sites for residue from resource recovery facilities, specifically:

a. tonnage to be handled

b. sites for such disposal facilities

c. operational requirements to meet applicable environmental regulations in the future.

4. Short range improvements in landfilling procedures to improve compliance with environmental regulations, or to reduce costs to the City, or both.

5. Further uses of landfill sites including conversion to new uses such as methane gas recovery operations and compatibility with new laws affecting land use such as the Coastal Zone Management Act.

6. The condition of existing incinerators and the changes, if any, in projected upgrading or closing dates which will be caused by:

a. reduction of volume due to resource recovery implementation;

b. the City's ability to comply with existing or future regulations;

c. the technological potential of mechanisms to upgrade facilities.

7. The availability of other technological or operational changes which could reduce landfilling or incineration, or upgrade landfill or incinerator operation, such as, for instance,

source separation, new landfilling procedures, source reduction programs.

8. Special provisions for disposal of hazardous materials both in the near future and once resource recovery has been implemented.

9. Future uses of existing marine transfer stations and the need for immediate or future construction of new marine transfer stations (and their location) in the context of future disposal operations, including resource recovery.

1.2 Present Collection Operations

Resource recovery must be understood as well in the context of present collection operations of the Department of Sanitation. In this regard, it will be necessary to address at least the following concerns:

1. What changes should be made, if any, to present collection routes and/or procedures of the Department:

a. presently;

b. in anticipation of implementation of a first or a series of resource recovery facilities;

c. once resource recovery is partially and then fully in place;

d. to comply with coterminality mandate of the City Charter.

2. What effect will the choice of any particular site or series of sites for resource recovery facilities have on collection operations and costs?

3. What effect will resource recovery implementation, as a general matter, have on the cost of collection?

4. What trade-offs should be made between potential increased costs of collection due to resource recovery siting and potential economic or social or economic development advantages of a particular site for resource recovery?

5. What effect will actions taken in response to environmental regulations on landfilling or incineration have on present collection practices and costs? Are some forms of environmental compliance more or less costly to or disruptive of the collection operation than others?

6. How will future uses of existing marine transfer stations and the need for immediate or future construction of new marine transfer stations (and their location) impact future collection operations?

1.3 Economic Development Opportunities

1. What public purpose or purposes does the City hope to further in implementing resource recovery and what particular implementation strategies will further that purpose or those purposes?

The most obvious issue in this area is the extent to which resource recovery is simply a socially and environmentally more desirable disposal method to landfilling or incineration rather than a tool to be exploited in the context of economic development. The questions to be answered as part of this issue include:

What are the economics of any particular project or of projects in general? What differences will be reflected in the economics, both in terms of capital cost and mechanisms to pay that capital cost and in terms of tipping fees, if the City chooses simply to use resource recovery to dispose of solid waste or if the City emphasizes, in varying degrees, production of lower cost energy, recovery of materials and the industries which might be fostered by such recovery? This includes investigating job creation potential either in industrial parks or by creation of lower cost energy for a designated segment of commerce or industry. It includes investigating capital financing through a mechanism such as the Port Authority and the potential which such a financing has to reduce debt service costs reflected in tipping fees. It includes investigation of primary and secondary markets for recovered materials and industries which might be attracted by such activities. It includes investigating the possibility of funding by a federal economic development agency of the increased burden of a tipping fee, if any increase is to be borne.

2. What are the opportunities to produce lower cost energy for resource recovery?

This question will in part be addressed specifically in the context raised above of the extent to which resource recovery is used as an economic development strategy. It must,

however, also be addressed in isolation to resolve such issues as:

a. the role or roles for private utilities such as Con Edison or Brooklyn Union Gas;

b. the role or roles for Public Power Authorities, such as PASNY;

c. Whether, as has been asserted, there are economies of scale to be achieved in concentrating the use of processed refuse as a fuel in a single power plant and whether if such an approach is economically desirable, to what extent it is technologically feasible and desirable in the context of Sanitation Department operations;

d. do legal strictures exist to prevent passing through reduced costs of energy through the Con Edison distribution network? What impact would final denial by the PSC of the Area Development Rate have as a precedent in this area?

e. in what context would reduced energy costs be most effectively passed through? to what class or classes of customers?

We anticipate that many of the answers to these questions will be derived from the work done on the City's second project, in conjunction with the Port Authority, Power Authority and UDC, and from the Port Authority's investigation of resource recovery in the context of industrial parks. The City's first project will proceed as a waste disposal oriented (rather than economic development oriented) project on the theory that it is of prime

importance for the City to gain experience in the institutional and technological aspects of resource recovery in a reasonably simple context. Future projects would, however, reflect the decisions made about economic development strategies gained in the context of investigations by the City, Port and UDC, and in the context of the market investigations to be done in the City's first project.

1.4 Co-Disposal of Solid Waste and Sewage Sludge

Among the issues to be resolved are:

1. What is the present state of the art in the technology available to co-disposal?

2. What are the prospects for future technological advancements in this area?

3. What will be the cost effect of co-disposal; will it reduce or increase the cost of disposing of each waste product, and will the net economic effect overall be a reduction or increase in costs?

4. What are the environmental effects of co-disposal? What are the relative air pollution effects of a co-disposal facility and single disposal of solid waste and treatment of sludge?

5. What is the viability of sewage treatment in the future in economic, social and environmental terms, and what are the prospects for disposal of the residue of such treatment processes? Is composting a long term viable alternative?

6. What institutional relationships need to be developed

between the Department of Sanitation and the Department of Environmental Protection in proceeding to analyze co-disposal feasibility and in implementing co-disposal should it prove desirable? Should there be a realignment of agency missions in this area?

7. Has the interim solution to sludge disposal to meet the 1981 mandate to terminate ocean dumping adequately considered the potential for co-disposal and alteration of interim and long term strategies to account for co-disposal possibilities?

8. What effect would co-disposal have on the use of resource recovery as an economic development strategy?

9. What effect would co-disposal have on the difficulty or ease of siting facilities?

1.5 Institutional Relationships

1. What are the roles in financing and/or management assistance for federal and state agencies, including the USEPA, NYS Energy Office, NYS Department of Environmental Conservation, NYS Environmental Facilities Corporation, Urban Development Corporation, Port Authority of New York and New Jersey, Industrial Development Agency, PASNY?

a. We are already cognizant of our need to involve one or more of these agencies to provide financing assistance on resource recovery projects. In addition, we are aware of the roles for USDOE and USEPA in providing funding for planning and implementation of resource recovery. We propose that further understanding of roles and relationships will be gained

from the assessment to be undertaken as part of the preparation of the first request for proposal of the financing needs of the City and financing and legal capabilities of agencies interested in being of assistance. In addition, we expect that in the first undertaking and in the joint project to be attempted by the City, Port, UDC and PASNY, we will learn of our abilities to complement each other and of each of our respective strengths in working in this area.

b. As part of the DOE RFP preparation process we expect that we will also learn of the regulatory responsibilities in this area of state agencies, most notably DEC, but also the Public Service Commission's role, if any.

What mechanisms will be most successful for involving elected officials, local community officials and groups and administrative agencies in City government in the implementation process?

1. We are aware of the need to include many representatives of many interests in the planning and implementation process, particularly in identification of potential sites and selection of final sites and of technologies for those particular sites. In addition, mechanisms will have to be developed to fullfill the requirements of processes such as ULURP, to provide for meaningful participation of the Borough Presidents and their constituencies and of other members of the Board of Estimate throughout the process leading up to finalization of a contract for construction and operation of a particular facility. Finally, public participation under programs such

as RCRA will have to be organized and implemented.

1.6 Legal Constraints on Implementation of Resource Recovery

A considerable number of legal issues remain to be analyzed and appropriate legislative initiatives taken to make implementation of resource recovery feasible. An analysis of many of these is presently underway in anticipation of the 1979 legislative session in Albany, including:

1. the legal capacity of the City to contract for sufficiently long periods of time both for the operation of a facility and the sale of recovered materials and energy;

2. the adequacy of the presently authorized list of sites and the maximum tonnages for facilities in the City;

3. the applicability of state laws requiring strict competitive bidding and multiple bidding of construction contracts to resource recovery facilities; the applicability of such requirements to facilities constructed under the auspices of a public benefit corporation; the possibility of implementation of resource recovery under such strictures;

4. the authority of the City to control collection and disposal of solid waste by private carters;

5. the effect, if any, of the recent Supreme Court decision in a suit regarding regulation of out-of-state carters by New Jersey, on resource recovery implementation in New York City;

6. the extent to which existing environmental standards encourage or discourage resource recovery; the effect of resource recovery implementation on the SIP.

We expect that many other legal issues will be raised in the course of implementing a first project and that those listed above and any additional issues will be addressed by the work of the Corporation Counsel and the City's legal advisor on the preparation of our first request for proposal.

The broader issue of the interrelationship between the City and private carting firms will no doubt be of continuing concern, given the necessity for long term commitments by the City to any operator of a resource recovery facility. It is expected that such concerns will be considered in the broader assessment of the extent to which private carting should be used in the City, how it should be regulated, the prices which the City should charge for disposal to such carters and the disposal facilities which can be made available to them.

1.7 Approach to Resolution of Issues

As you can see, the issues we confront are many and complex. A number of them, including basic legal questions and institutional barriers, will be resolved during our first resource recovery project. The funding requested for second and third projects under the President's Urban Policy grants would allow many other areas to be investigated including economic development aspects, co-disposal of sludge and refuse, waste reduction opportunities, institutional roles for the Port Authority, the Urban Development Corporation, and the Power Authority, the optimum utilization of refuse derived materials and energy, and the creation of new jobs from resource recovery.

These grants would also allow us to expand the staff of the Resource Recovery Task Force to provide expertise in the fields of financing, marketing and economic development, urban planning, law, air pollution control, project management, land use management, waste reduction, public participation and information, and environmental education. In this regard, I have recently created a new position in the Department of Sanitation that recognizes for the first time the urgent need for full time assignment of top leadership to this and related programs. This position will be held by Paul Casowitz, who I have appointed the Deputy Commissioner for Resource Recovery and Waste Disposal Planning.

The Directors of the Resource Recovery Task Force and the Landfill Reclamation Task Force will report to Mr. Casowitz. He will also oversee and coordinate projects affecting long term solid waste management that are currently managed by the Bureaus of Engineering and Waste Disposal.

We expect that many other questions and issues will be addressed internally by the expanded staff of the Resource Recovery Task Force. Of particular importance, is a re-evaluation of past estimates of landfill closings when balanced against the need for long term landfill disposal capacity for recovery plant residuals and construction waste, the need for backup for scheduled and unscheduled maintenance of resource recovery facilities, and the relatively long lead times required to construct recovery plants. What is required is a

realistic approach that not only satisfies these needs, but one that also recognizes the need to upgrade landfills to meet stringent state and federal environmental standards. In this regard, we have taken some immediate corrective measures, in addition to initiating a consultant study to assess what long-term actions, and their costs, will be required to bring the landfills into compliance with environmentally sound practice. In addition, final land use plans for the landfills compatible with the Coastal Zone Management Act will have to be developed. The Task Force will also work closely with the Department of Environmental Protection staff on the sludge management study now in progress.

Subsequent sections of this report will present greater detail on present operations, construction programs in progress, and future plans for implementation of resource recovery facilities, public participation, waste reduction and methane recovery programs, and institutional requirements.

Although we anticipate that some of the answers to the issues associated with these programs will be derived internally by the Department of Sanitation in its formulation of policy, we will request the financial and technical assistance of US EPA and NYS DEC in seeking responses to others, including the possibility of construction funds for co-disposal facilities should they prove feasible. We anticipate that application for such funding will be made to US EPA in the first or second quarter of 1979.

In summary, we are taking a four-pronged approach to resolving the many issues and questions affecting long-range solid waste management policy in New York City:

1. Project implementation with utilization of the substantial resources of other public agencies such as the Port Authority, Urban Development Corporation, and the Power Authority.

2. Expansion of the City Resource Recovery Task Force and consolidation of other related areas under Paul Casowitz, Deputy Commissioner for Resource Recovery.

3. Establishment of a close working relationship with DEP staff on the sludge management study, both interim and long-term, and especially in the areas of sludge derived compost utilization in landfills and feasibility of co-disposal combustion facilities.

4. Application in the near future for technical and financial assistance from NYS DEC and US EPA to address other questions that are not resolved in project implementation or that require additional resources beyond the capabilities of the Department of Sanitation.

In regard to requests for further financial assistance, we envision that additional work will become part of a soon to be mandated State/US EPA agreement for solid waste programs funded by either the Clean Water Act, the Safe Drinking Act, or the Resource Conservation and Recovery Act. We believe this mechanism will assure an integrated approach that will avoid piecemeal and duplicative efforts in achieving our goals.

2.0 NEW YORK CITY REFUSE DISPOSAL: AN OVERVIEW

2.1 Budget, Staff and Facilities

The total Department of Sanitation expense budget anticipated and allocated for the fiscal year ending 1979 (7/1/78 - 6/30/79) is $274 million ($274,117,000). Of this, $236 million ($236,107,000) are for Personal Services.

Approximately $33 million ($33,343,278) are allocated to the Bureau of Waste Disposal. However, other indirect costs are incurred for waste disposal because of services provided by the Bureau of Motor Equipment and the Bureau of Building Management, fringe benefits, managerial overhead, capital amortization and other factors. The proper allocation of all costs for waste disposal operations will be determined as part of a detailed cost accounting study by a major public accounting firm in the near future.

In Fiscal Year 1978 the Department maintained an average personnel level totalling 12,030 employees. In contrast, the total number of full-time personnel assigned to and utilized by the Bureau of Waste Disposal in F.Y. 1978 was 1,078.

This staff is required to man and maintain the existing disposal system (Figure A) which consists of:

a. Three truck-fed landfills:

   1. Fountain Avenue
   2. Edgemere
   3. Brookfield

b. Two truck-fed landfills which receive construction waste only:
   1. Pennsylvania Avenue
   2. South Avenue

c. A large 3,000-acre barge-fed landfill - Fresh Kills.

d. Six 1,000-tpd incinerators:
   1. Hamilton Avenue
   2. South Shore
   3. Gansevoort Street
   4. Southwest Brooklyn
   5. Greenpoint
   6. Betts Avenue

e. Nine marine transfer stations at which trucks dump refuse into large barges with 600-ton capacities:
   1. South Bronx
   2. West 135 Street
   3. West 59 Street
   4. East 91 Street
   5. Gansevoort
   6. North Shore
   7. Southwest Brooklyn
   8. 52 Street
   9. Greenpoint

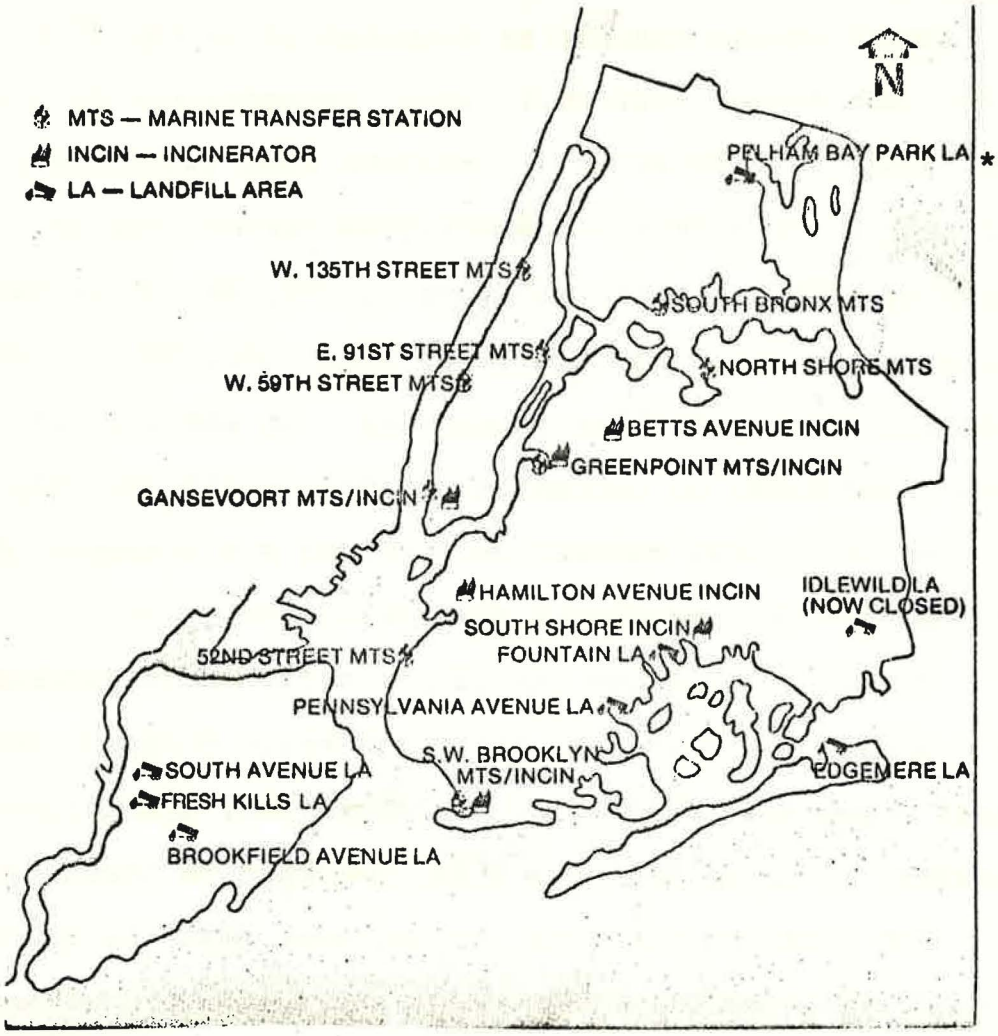


FIGURE A

NEW YORK CITY WASTE
DISPOSAL FACILITIES

* Pelham Bay Landfill ceased operation on January 1, 1979.

2.2 Refuse Quantities

Total refuse quantities disposed of in the City in the last fiscal year (F.Y. 1978) exceeded 6.4 million tons (6,468,221) of which 4.6 million tons (4,577,053) consisted of Department of Sanitation collections of household waste, 1.5 million tons (1,499,396) of private cartmen deliveries and .4 million tons (391,792) of construction waste and other categories. In addition to these quantities, an estimated 300,000 to 600,000 tons per year of private cartmen collections are disposed of outside the City, mainly in New Jersey landfills.

Figure B shows how the City's solid waste tonnage was disposed of in 1977 by the three major disposal methods: direct truck-fed landfilling, incineration, and marine transport by barge to Fresh Kills Landfill in Staten Island.

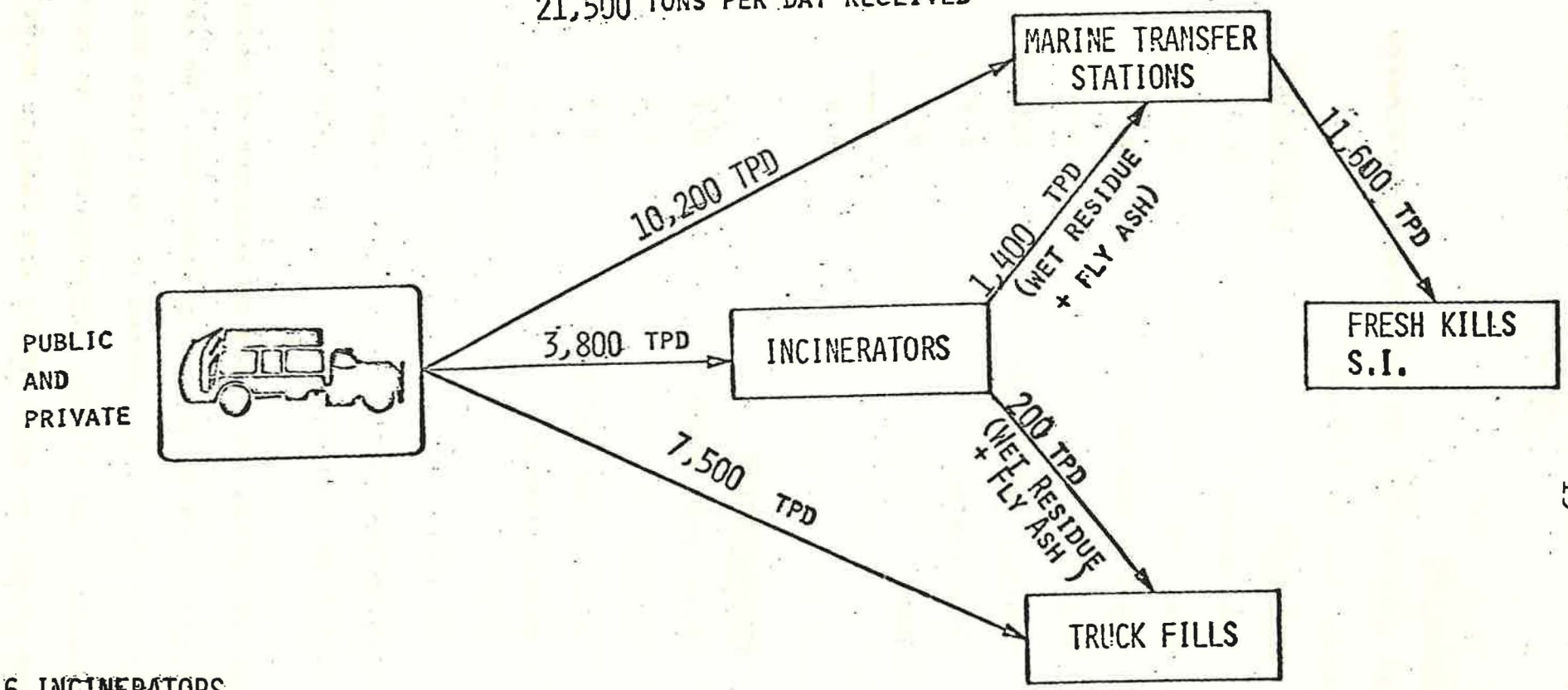
For planning purposes, we estimate that the quantities of solid waste by borough amenable to resource recovery processing are as follows:

BRONX	-	3,200	tons per day
BROOKLYN	-	5,700	" " "
MANHATTAN	-	5,100	" " "
QUEENS	-	5,300	" " "
STATEN ISLAND	-	800	" " "
TOTAL		20,100	" " "

FIGURE B

EXISTING WASTE DISPOSAL SYSTEM

21,500 TONS PER DAY RECEIVED*



6 INCINERATORS

6 TRUCK FILLS (4 SANITARY LANDFILLS;** 2 CONSTRUCTION WASTE LANDFILLS)

9 MARINE TRANSFER STATION (63 BARGES USED)

FRESH KILLS, S.I. SANITARY LANDFILL

(BARGE OPERATION ONLY, NO TRUCKS ALLOWED)

*APPROXIMATE NUMBERS BASED UPON 1977 DATA

**THERE ARE NOW THREE TRUCK-FED LANDFILLS IN OPERATION; PELHAM BAY LANDFILL CLOSED ON JANUARY 1, 1979

2.3 Refuse Composition

Refuse composition values currently estimated for City refuse are as follows:

BURNABLES	% by Weight
Food-waste	18.1
Textiles	0.7
Paper Products	52.5
Plastics	3.2
Leather and rubber	0.6
Yard wastes	4.9
Wood	0.8
	80.8

NON-BURNABLES	
Glass and ceramics	8.1
Metals	7.5
Brick, rock and dirt	2.6
Miscellaneous	1.0
	19.2

MOISTURE CONTENT	30%
HEAT OF COMBUSTION	5000 BTU/LB

These estimates are based on analyses of refuse delivered to City incinerators in the early seventies. We recognize that these estimates should be updated to facilitate design of resource recovery facilities. Consequently, as part of the US DOE work study, we will sample and analyze existing refuse

for composition and heats of combustion. The Port Authority in a separate study will analyze refuse composition originating in the southern areas of Brooklyn and Queens.

2.4 Department of Sanitation Collection Program

The Department of Sanitation is responsible for the collection of household and various institutional refuse and bulky wastes generated within the 58 sanitation districts of the city.

Household refuse is collected either two or three times a week in residential areas, or five to six times a week in congested, heavily populated parts of the city.

In addition to the trucks assigned to regular household collection, the Department also operates hoist compactor refuse trucks and hoist-and-carry units which provide service to hospitals, schools, other tax-exempt institutions, and numerous garden apartment areas where conventional pickups would be uneconomical.

2.5 Private Carters

In New York City, private carters collect from commercial establishments. They currently pay a disposal fee of $3.50 per cubic yard for compacted refuse and $2.50 per cubic yard for uncompacted refuse. Depending upon the density of a given load, this amounts to an equivalent charge of between $7 and $15 per ton of refuse.

In general the choice of disposal locations by pri-

vate carters is not under the Department's direct control. This may become a significant issue as resource recovery plants come on-line, since each resource recovery plant must be guaranteed a minimum amount of refuse deliveries in order to properly finance these facilities.

2.6 Overall Operational Perspective

In order to put the previous budget and quantity figures in perspective, I want you to realize the vital importance of having an adequate and reliable refuse disposal network. Although costs for refuse disposal may seem small in comparison with overall department expenses, which mainly cover collection operations, an unreliable disposal system will impact upon the collection operation and serve to increase collection and transportation costs.

For example, if for any reason a City disposal facility is closed on a given day, trucks normally dumping there will have to travel farther distances to dispose of their loads. Consequently, more time is spent transporting the refuse and waiting on longer lines at facilities which are open. This cuts into time which would otherwise be available for collection activities. The result is decreased productivity, greater costs, more wear and tear on trucks and reduced services. Private cartmen are similarly affected. Garbage also tends to remain on the street for a longer time before being picked up, and this leads to more litter and general unsightliness.

In summary, the network of disposal facilities is a critical element in the City's overall solid waste management system. Problems with disposal facilities propagate back into the cleaning and collection system, affecting costs and the cleanliness of the streets. This point is paramount in understanding the decision making process with respect to waste disposal facilities. A reliable system requires adequate redundancy to handle emergencies. This in turn has affected our planning for new facilities, both conventional and resource recovery, which I will discuss later.

3.0 RECENT IMPACTS ON DISPOSAL SYSTEM

3.1 Environmental Regulations

New laws have been promulgated at both the State and Federal level calling for more environmentally sound disposal techniques. As a result, the City is faced with the task of overhauling its existing disposal system. This program will require the expenditure of large sums of public money. A brief description of the impacts of these laws is provided below:

3.1.1 New York State Part 360 Regulations

In 1977, the State Legislature amended the Environmental Conservation Law. Article 27, Title 5 of the amended law authorized the Department of Environmental Conservation (DEC) to regulate the design, construction and operation of all solid waste management facilities and also authorized the promulgation of rules and regulations to accomplish this. Subsequent to this, DEC revised Part 360 of Volume 6 of the New York Code of Rules and Regulations. The new Part 360 regulations had an effective date of August 28, 1977. With respect to New York City, this required the filing of permit applications for 25 waste disposal facilities by February 28, 1978.

The information required in these applications was voluminous, but a crash program by our relatively small staff in this area succeeded in submitting whatever data were availa-

ble. As of this date, the applications for all of the marine transfer stations and incinerators have been deemed complete, although corrective actions may be required for some of them.

The landfills, however, are a special case, because very detailed engineering information was required in the areas of topography, refuse and sub-soil compositions, leachate, hydrological studies, and overal conformance of the landfill operations with Part 360 and other environmental laws.

It was clear to both DEC and to Sanitation that the time frame allowed for preparing complete applications for the landfills under Part 360 was inadequate. However, the City, although disagreeing with some of the specifics of the regulations, agreed to take steps to bring landfill operations into conformance.

In cooperation with the State a three stage plan was agreed to:

Phase I - consists of the identification and correction of a number of first order operational problems.

Phase 2A - consists of a consultant study to provide detailed engineering data to determine the feasibility of modifying the design and operation of the City's landfills so that they will conform to applicable requirements.

Phase 2B - will consist of the formulation of a detailed compliance plan.

Phase 3 - will be the actual implementation of the compliance plan.

With regard to Phase 1, DEC in July of 1978 identified a number of operational problems in need of immediate correction. For the landfills, the actions included such things as sampling of streams for the presence of leachate, collection or stoppage of leachate in a number of areas, application of cover material, suspension of cover material mining operations in a particular location, and removal of refuse from areas too close to existing streams. Many of the DEC actions have been accomplished at various landfills. Others, requiring greater resources, are still being worked on and will eventually be corrected.

With regard to Phase 2, a consultant contract in the amount of $108,000 was approved by the Board of Estimate on September 28, 1978 and awarded to the consulting engineering firm of Parsons Brinkerhoff-Cosulich. This contract is now in effect and should result in a detailed compliance plan by July, 1979.

3.1.2 Federal Clean Air Act Compliance Measures

In July of 1977, the U.S. Environmental Protection Agency (USEPA), acting under provisions of the Federal Clean Air Act, obtained a consent order to close or limit the operation of four of the Citys six incinerators, or to have them upgraded to meet particulate emission standards, according to specific schedules. The schedules for these incinerators are as follows:

1. Betts Avenue Incinerator
   - Tonnage to be limited to 500 tons per day starting in May, 1979.
   - Construction of air pollution control devices completed by March, 1981.
   - Compliance with air code demonstrated by July, 1981.
2. Gansevoort Incinerator
   - Tonnage presently limited to 500 tons per day.
   - The facility will be closed upon receipt of binding written assurance from the N.Y.S. Department of Transportation and the Federal Highway Administration that the closing of the incinerator will not jeopardize

functional replacement of the facility if the West Side Highway is built. The USEPA can request the court to order the facility closed if such assurance is not received by July 1, 1979. Assurance has not yet been received, but is expected shortly. *

3. Hamilton Avenue Incinerator

   . The facility will be closed after construction of the Hamilton Avenue Marine Transfer Station or on January 1, 1981 whichever is sooner.

4. South Shore Incinerator

   . Tonnage presently limited to 500 tons per day.

   . The facility is likely to be closed on July 1, 1980.

In summary, the City will close three incinerators (Gansevoort, Hamilton Avenue and South Shore) and will upgrade three incinerators (Betts Avenue, Southwest Brooklyn and Greenpoint). The closing of the incinerators represents a substantial loss of waste disposal capacity. This lost capacity, however, could be more than made up by the construction of the Hamilton Avenue and the New South Bronx MTS, sometimes referred to as the Barretto Point MTS and increased

*The letters of assurance from NYS DOT and FHWA have since been received and the incinerator will probably be closed in the near future.

unloading capacity at Fresh Kills. A discussion of the incinerator upgrading and marine transfer station construction program appears in Section 4.0

3.2 Closing of Pelham Bay Landfill

The Pelham Bay landfill ceased operation on January 1, 1979. Prior to closing, this landfill was disposing of approximately 2700 tons per day, of which approximately 1800 tons per day was Sanitation collected refuse.

To afford efficient and cost-effective interim disposal of refuse collected by the Department of Sanitation in the Bronx, the material will be delivered to the South Bronx Marine Transfer Station at Hunts Point. The extra barges required will be obtained by diverting all private carting material presently accepted at various incinerators and marine transfer stations to truckfills, thereby freeing-up barges from other locations that would ordinarily contain private carting refuse.* This plan went into effect on January 1, 1979, and will continue until necessary repairs are made on existing diggers at Fresh Kills to provide a seventh digger shift, probably in May 1979. This extra digger or unloading shift will provide enough unloading capacity to replace that lost by the closing of Pelham landfill.

* Sanitation is providing one barge to privates on the 12 to 8:00 AM shift at both the Gansevoort and North Shore MTS's.

3.3 Federal Regulations on Landfill Operations

There is some confusion by the public and the press on federal regulations regarding landfills. For example, one often hears the statement that federal law will prohibit landfilling after 1985. This is simply not the case.

Under the Resource Conservation and Recovery Act of 1976, (RCRA), US EPA is required under Subtitle D to issue criteria for defining what constitutes acceptable land disposal practices. These criteria are expected to be published in final form in July, 1979. Any landfill not meeting the criteria will be classified an open dump.

The above assessment will be the responsibility of the State. In New York State, the Department of Environmental Conservation will make the determination and will be required to provide an inventory of open dumps within one year after final criteria promulgation.

Any landfill classified as an open dump must be closed or upgraded within five years. On the other hand, a landfill meeting the federal criteria may remain open indefinitely into the future.

As a practical matter, the federal criteria have been in circulation in draft form for sometime. It appears that the State , Part 360 landfill regulations have adequately anticipated the federal criteria in the sense that the State rules are equally or more stringent than the corresponding federal ones.

Consequently, any landfill that is issued a Part 360 permit will, with very high probability, meet the federal standards when the latter eventually become law. The only exception might be federal provisions on the control of seagulls, which Part 360 does not address.

4.0 PLANS FOR CONVENTIONAL FACILITIES

4.1 Incinerator Upgrading Program

The Department of Sanitation is upgrading three municipal incinerators (Greenpoint, Southwest Brooklyn and Betts Avenue), to bring them into compliance with applicable air standards. Electrostatic precipitation is the technology being used to treat the flue gases. The overall anticipated cost for rehabilitation and installation of air pollution control (APC) devices will be approximately $50 million, with 50-50 cost sharing by City-State.

Of the Department's six active incinerators, Gansevoort was not included in the APC and rehabilitation program because the future plans for the West Side Highway will close that facility (including the MTS).

The following explains the status at each location.

1. Greenpoint Incinerator

APC: Construction is in progress and should be completed by January, 1980.

Rehabilitation: Construction began in August, 1974 with a total bid price of $4.2 million, and the work is substantially completed.

2. Southwest Brooklyn Incinerator

APC: Construction began in July, 1974 with a total bid price of $7.5 million, and an expected completion date in June, 1979.

Rehabilitation: Construction began in July of 1974 with a total bid price of $4.1 million, and is also expected to be completed in June of 1979.

3. Betts Avenue Incinerator

APC: The bids received totaled $13 million, and construction is expected to be completed in August of 1980.

Rehabilitation: Design began in-house in September 1975 and was completed in September, 1976. Bids were solicited in December of 1978 and construction is expected to be completed, August of 1980.

4. Hamilton Avenue Incinerator

Bids were received for the APC work in early 1974 but were rejected as being too high. The Department has not pursued upgrading the facility and will likely shut it down by 1981.

5. South Shore Incinerator

Higher than estimated bids in 1974 have also caused the Department not to upgrade this facility. It is operating at reduced levels and is expected to close by 1980.

4.2 Marine Unloading Facilities

The Marine Unloading Facility at Plant #2, Fresh Kills, is undergoing electrification to improve its performance. This work is expected to be completed in May, 1979.

The Department has attempted to purchase a 4th unloader but did not receive any bids. We are now investigating the

purchase of a smaller mobile crane which could be used in times of emergency to ease the burden of unloading.

4.3 Marine Transfer Stations

Two new marine transfer stations have been designed to reduce truck travel time in our system and to replace the capacity lost by the future closing of three incinerators and the Pelham Bay Landfill. The Hamilton Avenue MTS would replace the incinerator which is closing at that location. The New South Bronx MTS could provide the Bronx with enough disposal capacity to replace that lost by the closing of the Pelham Bay Landfill.

Each of the new facilities is estimated to cost $16 million. Part 360 permits are now being sought and advertising of each facility is expected by June of 1979. Barring unforeseen delays, construction of both facilities could be completed in June of 1982*

4.4 Capital Budget Summary for Fiscal Year 1979

Of the $76 million Sanitation capital budget authorized for F.Y. 1979 a total of $50.5 million is dedicated to waste disposal needs. The major portion of this amount, $32 million, is for the construction of the two marine transfer stations. The remaining $18 million will be used for upgrading and rehabilitation of the existing system to conform to Federal and State regulations.

* The need to construct these marine transfer stations is being reappraised, with construction of resource recovery facilities as possible alternatives.

5.0 PLANS FOR RESOURCE RECOVERY

5.1 General Considerations

Approximately 80% of the City's refuse is landfilled and this percentage will increase upon closing of the three incinerators previously mentioned. Studies have shown that a program to implement alternative methods of waste disposal must be instituted now in order to prevent a crisis in the future.

Of the various alternative methods for disposing of solid waste, the one that seems most promising is resource recovery. Resource recovery facilities are designed to convert or segregate raw refuse into useful commodities such as fuel, steam, electricity, steel, aluminum and glass.

Like New York, many cities face the same problem of dwindling landfills, with no prospect of opening new ones. In response, a handful of resource recovery facilities have been built and are in operation in this country. Many others are either under construction, in design or the object of contractual arrangements.

Nationwide, it is likely that many new resource recovery facilities will be built and operated by private firms via contracts with municipalities. In such contracts, the municipality would be obligated to deliver a specified tonnage of refuse to the facility for a period of say twenty years and to pay the owner or operator a "tipping" fee for the disposal service provided.

A tipping fee is required for all known resource recovery processes, reflecting the fact that revenues from the sale of products are less than total costs and acceptable corporate profits. Manufacturing costs include operating and maintenance expenses, and debt service (principal and interest on initial capital investment). Acceptable profits for a particular corporation is a complex function of many variables including such things as tax bracket, outstanding debt, availability of alternative investment opportunities and their expected rates of return, availability of equity investment funds, corporate strength in the credit markets, project risks, and other factors. No private firm would undertake the construction and operation of a resource recovery facility unless adequate profit results therefrom.

The choice by the City of a particular firm to construct and operate a resource recovery plant would be determined by a competitive bidding process, which will be described later.

Execution of a long-term contract would be the culmination of the bidding process and would be the legal basis upon which construction,operation, and payments for services rendered would be determined.

A resource recovery contract is, of necessity, fairly complex, because it must define the obligations of both parties for a period of twenty or more years, during which time many things can change, e.g. new environmental laws, different refuse composition, drastic jumps in the value of products produced,

plant modifications to recover new products, etc. Because of this, the City is presently devoting substantial time, and resources to development of a model contract tailored to our needs, legal constraints, and sense of acceptable risks.

Subsequent sections will outline what immediate steps will be taken to implement the City's first resource recovery project, and what broader issues must be resolved in succeeding projects. Prior to this discussion, however, the next section will summarize the state-of-the-art of resource recovery technology, what other cities have done or plan to do, and some of the problems encountered in this emerging new industry.

5.2 Status of Resource Recovery Technology in the U.S.

This section describes the status of some resource recovery facilities in operation or construction in the U.S.

5.2.1 Mass Burning Waterwall Steam Generating Facilities

This technique consists of burning raw refuse on a grate, with no front-end separation or processing of the refuse. Waterwall tubes wrapped around the furnace allow efficient generation of steam either for direct utilization in heating or processing, or for subsequent generation of electricity. This process, called waterwall steam generation, is widely used throughout Europe and Japan. Of the major resource recovery processes, this system comes closest to being designated as "fully proven" technology.

Major U.S. facilities are currently operating in Saugus, Mass. (just outside Boston), Harrisburg, Pa., Nashville, Tenn. and Chicago.

Saugus, Mass.

A waterwall incinerator for processing 1200 tons per day of refuse has been operated here since 1975 by a private company (RESCO - a joint venture of De Matteo Construction Company and Wheelabrator Frye-Inc.) to service Saugus and other communities in the north Boston area.

Like most facilities it had its initial start-up problems (those relating primarily to grate wear and tear and superheater corrosion) but these have since been resolved.

Steam is generated and sold to a single industrial customer (General Electric) on a 7 day per week basis. At certain times during the year (summer months when space heating demand is lowest) the customer is unable to use all the steam the plant produces, so that some steam must be vented to the atmosphere. Steam is also used by the customer for turbine testing and at other times during the year steam demand is greater than what the plant can deliver.

The reported capital cost of this facility is $50 million. The current tipping fee charged to the ten communities (including Saugus) is $14.20/ton (as of 12/78). This fee is subject to a cost of living escalator to reflect increases in labor and other operating costs.

Harrisburg, Pa.

A 720 ton per day waterwall steam generator has been operated by the City of Harrisburg, Pa. since 1972. The steam is used for various purposes. Roughly, one quarter was used to drive a bulky waste shredder but which is now (8/78) out of service. Another portion of the generated steam is used for internal space heating. The remainder of the generated steam has not been utilized until recently. In October of 1978, a steam main from the plant to a local utility's district heating system was completed, and is now, reportedly, in operation. The city also expects to utilize steam for sewage sludge drying by mid-1979.

The plant currently operates at approximately 60-65 percent of its 720 tons per day capacity. In order to increase its utilization rate the city is currently considering the reduction of its dump charge to private cartmen who can deliver a minimum quantity of refuse per month.

The current disposal charge is $10.80/ton for deliveries of more than 1000 tons per month, $11.80/ton for deliveries of less than 1000 tons per month. The city maintains an internal book-keeping system with which it charges itself the above rates for its own deliveries of household wastes.

Nashville, Tenn.

In Nashville, Tenn., a 720 ton/day facility (called the Nashville Thermal Transfer Plant) has been operated by a non-profit corp., the Nashville Thermal Transfer Corp. "on and off" since 1974. The facility supplies steam and chilled water to 28 downtown Nashville buildings, utilizing both refuse and conventional fossil fuels (approximately 70% of the energy input is from refuse).

After the original start-up in 1974, the facility experienced problems with air pollution, boiler tube corrosion, and insufficient revenues to financially support the facility. Most of these problems have since been resolved, although at increased, un-anticipated costs. Interestingly, one of the causes of the financial problems was the belief that the city of Nashville and surrounding Davidson County would not be charged a disposal fee.

However, it became obvious, once the plant was constructed and in operation, that the revenues from the sale of steam (at $5.90/1000 lbs.) would not be sufficient to pay the ownership and high maintenance and operating costs of refuse-energy conversion.

One encouraging feature of this plant's operation was its performance in the "deep freeze" winter of 1976 and early 1977. At that time the plant's customers were able to stay open, while many schools and factories in the area were shut down when natural gas supplies were curtailed.

Chicago Northwest

A fairly large waterwall steam generator (Chicago Northwest) of 1600 tons per day capacity, has been operated by the City of Chicago since 1971. The plant has performed its waste disposal function rather well. However, the steam which has been produced (and condensed) since 1971 has not yet had a customer.

As of July of 1978, a steam market agreement was being negotiated with a candy factory approximately 1/3 of a mile from the plant. The steam delivery line is currently under construction and is expected to be on line in early 1980.

5.2.2. Refuse Derived Solid Fuel (RDSF)

A major trend in refuse-to-energy recovery in the U.S. is the conversion to a dry refuse derived solid fuel (RDSF) for sale to a boiler owner, usually a utility, or for use in a boiler specially designed for burning RDSF ("dedicated boiler"). The production of RDSF also allows marketable

materials such as ferrous, aluminum and glass to be separated.

The advantage of selling RDSF to a boiler owner is that it only requires the adaptation of the existing boiler and does not require the initial capital expenditures of a new boiler. However, the burning of RDSF in boilers which were not originally designed to burn refuse has created boiler efficiency problems, slagging and corrosion of boiler tubes, and air pollution control problems.

Major RDSF facilities in the construction, startup or operating stages are discussed below:

Milwaukee, Wisconsin

This RDSF manufacturing facility with a peak capacity of 1600 tons per day of refuse was privately financed and constructed by Americology, Inc., a subsidiary of the American Can. Corp. Startup and testing of the plant commenced in February of 1977.

As of December, 1978, almost two years later, the plant is still not in commercial operation. Reportedly, the throughput for this plant (as of May, 1978) on any given day was only 300 to 400 tons.

The RDSF, which is a fluff type product, has been co-fired with coal in one of the local utility's (Wisconsin Electric Power Company) boilers. Some reports indicate that there have been "slagging" problems in burning the RDSF, due to residual glass particles in the fuel melting and adhering to the boiler walls. Residual metals in the fuel then deposit on the sticky glass, forming the equivalent of

re-inforced concrete, and this adversely affects heat transfer.

However, it is not entirely clear whether the combustion problems are caused by the RDSF or by the type of coal which is being used.

The current tipping fee charge to the city of Milwaukee is reported at $10.68 per ton. However, since only 1/4 of the plant capacity is being utilized during this "shakedown" period, and since the RDSF product is not being entirely burned (part is being landfilled), the actual net disposal cost chargeable to the facility is probably much higher.

Ames, Iowa

This smaller sized fluff RDF facility with a capacity of 400 tons per day has been operating since September, 1975. The RDSF has been fired successfully in a municipal power plant, with most of the RDF combustion taking place on a bottom grate rather than in full suspension, thereby improving the burnout.

The aluminum separation equipment is not yet operational. We are in the process of obtaining additional information on the operations of other materials recovery modules, and the product marketing program.

The town's reported net disposal cost is in the range of $10 to $15 dollars per ton. Other sources indicate that it may be higher since the quantity of refuse currently processed, 150 tons per day, is less than half of the design

capacity of 400 tons per day

Chicago Southwest

This fluff RDSF facility rated at 1000 tons per day capacity, has been in "startup" mode since November of 1976.

The City of Chicago, which owns and operates this facility, had experienced some equipment problems in the early stages of "startup" operation. By the beginning of 1978, their air-classifier (used to separate a light fraction of the refuse to be used as fuel) "problems" had been solved. At that time (1/24/78) the refuse throughput was approximately 200-300 tons per day. The intention had always been to fire RDSF in two of Commonwealth Edison's boilers. However, the boilers have been "down" for annual overhaul, and to our knowledge, as of May, 1978, there have been no test firings.

The economics of this project do not appear promising. For one thing, full capacity utilization has not yet been achieved; further, even if full capacity is reached the price which Commonwealth Edison will pay for the fuel is only $0.30/million BTU's or $3.50/ton. This will provide a revenue credit to the facility of, at most, $3.00 per ton of refuse.

Bridgeport, Connecticut

Construction of this 1500 ton per day Eco-Fuel facility commenced December 12, 1974. This plant which will produce a powdered fuel for sale to the United Illuminating Company is expected to be in "startup" operation by mid-1979.

Very little can be said about the Eco-Fuel process (technology and economics) until this plant is fully operational.

The anticipated tipping fee charge to the municipalities in the Greater Bridgeport area is in the range of $15/ton.

Hempstead, Long Island

This plant with a capacity of 2000 tons per day will produce RDSF for use in two dedicated boilers. The plant is now in startup mode and is expected to be fully operational by the spring of 1979.

This plant is privately owned and operated by the Hempstead Resource Recovery Corporation, which is a subsidiary of Parsons and Whittermore, Inc. It will produce a "wet" fuel, i.e. with 50% moisture content, to be burned in a stoker boiler to produce steam. The steam will drive L.I.L.C.O's turbines to generate electricity. Steel, aluminum, and color sorted glass will also be produced.

In the initial testing which began in August of 1978, the company had problems with conveyors and ash handling and removal equipment.

Like Bridgeport, it is too early to evaluate this system. The current anticipated dump charge to the town of Hempstead is in the range of $12-$15 per ton.

Akron, Ohio

This facility with a capacity of 1200 tons per day will also produce RDSF for use in a dedicated boiler. The plant

is currently in construction and is expected to be in shakedown by mid-1979, and fully operational by January, 1980.

Total capital costs (engineering, design, construction and financing) are reported at $46 million. The current, anticipated dump charge to Akron is $3.50/ton.

Teledyne National Corp. will operate this facility. Teledyne is currently operating an RDF manufacturing plant in Cockeysville, Md. The RDF is used for testing purposes, with most of it being landfilled.

Niagra Falls, New York

The Hooker Chemical Corporation, a subsidiary of Occidental Petroleum, is currently constructing a 2200 ton per day RDF facility, a semi-suspension fired waterwall boiler, and two 25 megawatt turbine generators.

The plant will generate high pressure steam and electricity for use in its own chemicals and plastics operation. The construction is expected to be completed by the end of 1979, and the plant fully operational by mid-1980.

5.2.3. Other Technologies

These include composting, pyrolysis, anaerobic digestion and ethanol production.

The economic feasibility of composting depends primarily on the availability of long-term markets in the vicinity of the compost plant. In the New York area these markets are limited and where they do exist, compost prices tend to fluctuate significantly. Heavy metals in the product limit the use of refuse derived compost to non-edible crops. Generally, where compost plants have failed throughout the world, it has been attributed to lack or loss of customers. Nevertheless, this technique will be implemented for sewage sludge as an interim solution to meet the December 31, 1981 deadline for cessation of ocean disposal of sludge. The sludge-produced compost will be used in developed and undeveloped city parklands, including landfill areas.

Pyrolytic conversion of refuse to liquid or gaseous fuels is still in the development and demonstration stages.

In San Diego County, California a 200 ton per day pyrolysis plant, built by the Occidental Petroleum Corp., for converting refuse to an oil product has been and still is in a shakedown mode for almost two years. The energy efficiency of this process does not look favorable.

In Baltimore, Md. a two-stage pyrolysis plant (rated at 700 tons per day), for converting refuse to gas and then to steam, experienced so many technical problems in pollution

control, design of ash and slag handling systems, and basic reactor operation that the creator and operator of the facility, Monsanto Landgard Co., withdrew from the program in early 1977. The reason given was "continuing mechanical unreliability and the inability to predict clear success." Attempts continue to make this plant work, but no clear advantages of this technology are apparent. When all is said and done, it is basically a refuse to steam technology, and other technologies to do this seem less risky and therefore more appropriate for New York City.

In South Charleston, West Virginia, a 200 ton per day demonstration pyrolysis plant (Purox system) built by the Union Carbide Corp., has been operated to produce a marketable gaseous product. Technical difficulties experienced in its startup operation appear to be resolved. However, process economics are still uncertain. Although this technology has many environmental assets, such as sterile ash and low air pollution, and has been successfully run in a co-disposal mode with sewage sludge, indications are that a Purox plant would be very expensive to construct and operate. In addition, Union Carbide does not appear to be willing to finance the construction of such plants under a full service contract, which is the procurement method the City is leaning towards.

Further development work by Union Carbide has been

discontinued. A Wall Street Journal article dated January 3, 1979 pointed out that the "Linde Division ... has curtailed development of a solid waste disposal system called 'Purox' despite a $10 million investment", apparently as part of Union Carbide's strategy of divesting itself of small, unprofitable ventures.

There are other resource recovery technologies in the early stages of development, namely anaerobic digestion, ethanol production, and a variety of other pyrolysis techniques. None of these is sufficiently advanced to warrant full-scale implementation in New York, although their progress will be carefully watched.

5.2.4. Technical Risks

It is clear from this brief review of resource recovery technology that the field is still emerging. Except for mass burning waterwall steam generation there is very little, if anything, that one can point to with confidence. And even mass burning, it appears, continues to have its problems with every new plant.

Nevertheless, we are optimistic that some of the newer systems will be brought to fruition in the next few years and that subsequent second - generation designs will minimize present operating problems. In the mean-time, the City, because of these technical risks, must be cautious in entering into long-term contracts even in those cases where a private firm is willing to finance a facility and offer a low tipping-fee. If a plant is a technical failure, despite contractural provisions for liquidated damages and other penalties, the City will be a loser, not only in time but in overall market credibility. A failure early in our program will impact the financing of all subsequent facilities. We therefore have a responsibility to scrutinize the technical risks of any proposal, no matter how promising the economics may appear.

5.3. New York City's First Resource Recovery

On October 24, 1978, Mayor Koch issued a statement entitled, "New York City's Approach to Resource Recovery." which indicated the Administration's intent to proceed immediately with the City's first resource recovery project, and with subsequent projects soon after that. The statement discussed the two major categories of risk associated with resource recovery projects; technical and economic.

Technical risks have been described in the previous section. Economic risks arise because the tipping fee can "float" depending on cost of living indexes, fluctuations in revenues, and other factors. In addition, the interest rate on bonds issued to finance a resource recovery plant is dependent on how the financial community assesses the overall strengths and weaknesses of the project. A well structured project with minimum technical, marketing and institutional risks would presumably lead to a lower interest rate on the bonds. A few points difference on the bond interest rate can translate into millions of dollars over the life of the project.

For example, consider a 3000 ton per day facility with a capital cost of $150 million. The difference in debt service payments over a twenty-year project life with two different interest rates of 9% and 7% is approximately $45.5 million or about $2.50 for every ton delivered to the plant.

Bearing in mind that the City will have to implement the equivalent of anywhere from six to eight plants of this size, one can appreciate the vast sums of public monies at issue. And bond iterest rate is just one of many factors that affect overall project costs. Clearly, such considerations obligate the City to be not only cautious; they require that first rate consulting expertise in the areas of law, finance, engineering and management be brought to bear in structuring a first project.

In this vein, the Department of Sanitation has retained the services of three firms experienced in resource recovery. Contracts have been awarded to the following firms:

1. Hawkins, Delafield & Wood for legal services not to exceed $100,000.
2. Smith Barney, Harris Upham, an investment banking firm, for financial consulting services not to exceed $150,000.
3. DSI Resource Systems Group, Inc. for technical and management services in the amount of $ 457,899.

DSI will also subcontract with Charles R. Velzy Associates, Inc. an engineering consulting firm experienced in resource recovery to perform certain detailed technical analyses as the need arises.

Services provided by the above firms will be funded entirely by a federal grant from the U.S. Department of Energy. The major milestones of the resource recovery procurement

process will be as follows:

a) site evaluation and selection, including identification of the most promising sites for second and third projects.

b) legal, financial, and technical analysis of the project;

c) preparation and issuance of a competitive request for proposals (RFP) sometime in the summer of 1979.

These steps will be followed by evaluation of proposals, negotiations with the successful proposer to develop a detailed contract, contract approvals and execution, issuance of bonds, and actual construction completed sometime in 1983. We anticipate receiving subsequent federal funds to cover expenses incurred for those steps subsequent to the issuance of the RFP.

We believe that this approach is the correct one, because it is the process that has been used successfully in other projects around the country. In addition, our in-house staff will reap substantial benefits from this project, since they will be working closely with highly qualified and experienced consultants.

Two important areas that will be explored in this first project are financing and legislation. A brief discussion of each follows:

(1) Financing: Preliminary analyses indicate that substantial economic benefits can accrue to the project if a portion of the capital

cost can be financed by New York State Environmental Quality Bond Act funds. That act authorizes a State bond issue for resource recovery projects for up to 50% of the capital cost of the project. In addition, the NYS Environmental Facilities Corporation (EFC), acting as an agent for a municipality, is empowered to issue tax-exempt bonds for such facilities. Therefore, it is conceivable that two issues of tax-exempt bonds by the State and EFC could be utilized to finance the total project. Both of these mechanisms will be scrutinized as part of the financial scope of work.

(2) Legislation: There remain a number of legal impediments to implementation of resource recovery. Some areas of particular concern are restraints on allowable sites, maximum tonnages per plant, procedures for vendor selection, and term of contract. Part of the scope of work of the legal consultant will be to investigate such areas and to prepare a legislative package to amend State laws accordingly.

This first resource recovery project will proceed primarily as a waste disposal oriented project, rather than an economic development oriented one, on the theory that it is of prime importance for the City to gain pro-project management experience in a reasonably simple setting. However, the most obvious issue in this area is the extent to which resource recovery is simply a socially and environmentally more desirable disposal method than land-filling or incineration, rather than a tool to be exploited in the context of economic development. This broader purpose of resource recovery will be carefully considered in second and third projects. A discussion of economic development vis-a-vis resource recovery appears in the next section.

5.4 Broader Issues Affecting the City's Resource Recovery Program

It is clear that the focus of the previous discussions has been on resource recovery as the primary solution to New York City's solid waste management problems.

Given the urgency of our solid waste management problems, it is imperative that we perceive resource recovery first and foremost as a waste disposal solution. However, it is also of importance to the City to pursue those ways in which this particular solution also lends itself to positive recovery of energy and materials, and to the dedication of those recovered resources to improve the economic climate of the City. While we are pursuing a waste disposal solution, we believe it important to determine the extent to which resource recovery is a workable economic development strategy and the most effective utilization of it as a stimulus to the private sector economy.

Can the energy produced from a resource recovery facility be cheaply priced; i.e. below market or negotiable value, so as to attract or retain certain businesses and industries (and jobs associated with these) in New York City? Since provision of lower cost energy is likely to be reflected in an increase in the tipping fee paid by the City, and since the expense budget of the City from which such costs will be paid is already stretched to the limit, it is important to

carefully assess the trade-offs to be made and to determine where on the continuum between pure waste disposal and pure economic development the City should be in developing future resource recovery projects.

In order to answer these questions and a host of related issues, and in order to develop second and third projects oriented towards economic development, two applications have been submitted for funding by US EPA under the Federal Program of Financial Assistance for Urban Areas under President Carter's Urban Policy.

One application submitted by the Port Authority of N.Y and N.J. requests funding to permit the Port Authority to develop a detailed, site-specific proposal for an industrial park whose tenants would be provided with energy (steam, electricity, etc.) from a resource recovery facility.

The theory in a most simplified form is that low priced refuse derived energy would help to attract tenants who would then build industrial facilities within the park. Jobs will be created not only in the construction phase of the facilities, but also in industries which will utilize recovered materials in their processes.

The other grant application is for a unique inter-agency cooperative undertaking, involving the City of New York, the Port Authority of New York and New Jersey, the Power Authority of the State of New York and the New York State Urban Development Corp.

Basically, this grant would be used towards develop-

ing a separate, economic development oriented project, which would utilize the legal technical and financial capabilities and experience of these agencies.

We see this core unit of four agencies cooperating in this particular venture as the basis on which to form inter-agency units, including other agencies from both state and federal governments, as well as an effective way to generate a broad base of public understanding and support for resource recovery.

Further discussion of these two projects appears in the next section.

5.5 Second and Third Resource Recovery Project

As discussed in the previous section, second and third projects, incorporating economic development considerations, will proceed in conjunction with grant applications submitted to US EPA under the Federal Urban Policy Program.

We envision a substantial amount of work to be undertaken for each of these projects.

As a second project, the City, in conjunction with Port Authority, PASNY, and the UDC has applied for grant funds to implement a resource recovery facility. The funding will be used to complete analyses required to develop a formal Request for Proposal and to prepare and issue the RFP document.

The work to be performed is separated into three phases. The detailed schedule of activities is quite elaborate, ranging from the identification of alternative plant sites in Phase 1 to finalizing Contracts for specific resource recovery systems, markets, and waste supply in Phase III. Throughout this project we intend to initiate and continue public participation and education, citizen advisory committee activities, and to ensure continued state agency support and involvement.

Phase I & II are expected to last a total of 9 months; Phase III also 9 months. Total expected project cost for all three phases is approximately $1.2 million.

This includes management, engineering, legal and financial consulting services, as well as services in-kind by the City, Port Authority, PASNY, and UDC staff.

The third project, sponsored by the Port Authority of New York and New Jersey, is a unique program of industrial development which makes use of resource recovery facilities to produce competitive energy and material products within an industrial park context. It is part of a coordinated effort involving the counties of Essex and Hudson in New Jersey and the City of New York, and is aimed at finding a regional solution to solid waste disposal.

The proposed project would examine the feasibility of locating resource recovery facilities at industrial parks in Newark and Jersey City, N.J. and in the Brooklyn and Queen's areas of the city.

The work is separated into two phases. The schedule of activities is also quite elaborate ranging from site identification, evaluation and selection to obtaining market commitments and securing waste supply guarantees.

The project also calls for evaluation of co-disposal of refuse with sludge, since the region is faced with the ban on ocean dumping of sludge by December 31, 1981.

A detailed assessment of the economic impacts of providing competitively priced, on-site power using solid waste will be an important output of this project.

Total expected project cost is approximately $1.3 million.

5.6 Other Potential Resource Recovery Projects

PASNY is currently funding an engineering study for evaluating the utilization of various refuse-derived energy products in their proposed coal fired 700Megawatt power plant. We expect that this power plant could use the energy derived from processing up to 3000 tons per day of refuse.

Early in 1979 the State D.O.T. will provide funds to begin an engineering study to determine the appropriate site and technologies for the replacement of the Gansevoort Incinerator and M.T.S. complex (which would be demolished if the West Side Highway project were implemented). This potential resource recovery project could conceivably consume 3000 or more tons of refuse per day.

The scheduling of resource recovery facilities associated with PASNY and Westway, should they proceed, must await overall development in these projects and the results of the feasibility studies.

The three projects previously discussed plus the PASNY and Westway facilities, three upgraded incinerators, and a facility to handle Staten Island refuse could account for all the processable refuse generated in the City.

6.0 SOURCE SEPARATION AND WASTE REDUCTION

6.1 Source Separation

The NYS DEC in their 1978 draft report "New York State Comprehensive Resource Recovery and Solid Waste Management Plan," to the State Legislature strongly supports the institution of recycling, source separation, and source reduction programs as an important strategy to complement high-technology resource recovery implementation.

Source separation may be defined as the setting aside of recyclable waste materials such as cans, bottles, newspapers, etc., at their point of generation (the home or office) for separate collection and subsequent processing and sale in the scrap or manufacturing marketplace. Because separation at the source avoids contamination of the recyclable materials which results from being co-mingled with mixed municipal wastes, the "product" recovered is relatively clean and generally of a higher quality and is obtained at a lower cost than results from processing mixed municipal waste in a full-scale resource recovery facility. To achieve maximum value for this waste resource, each commodity must be collected and stored separately at the point of generation, such as the household, commercial or industrial establishment. Source separation techniques are quite flexible and range from municipal or private carter pickup at the home to the homeowner transport-

ing the separated materials to a recycling center or to a landfill where separate containers are utilized to store the materials prior to sale.

The benefits of source separation programs are many: savings in landfill space, reduced collection and disposal costs, conservation of natural resources, reduction of litter, energy savings vis-a-vis use of virgin materials, and generation of revenue from the sale of recovered materials.

These programs also afford the public an opportunity to enhance the environment by direct participation, as well as providing educational, social and job opportunities. Many participants become very knowledgable and articulate about solid waste and conservation issues, thereby providing valuable input and feedback into government planning and implementation programs.

Because of the foregoing factors, the City will encourage the implementation of source separation programs as part of its overall solid waste management strategy.

Some existing and potential source separation programs are described below.

6.1.1 Department of Sanitation Newspaper Recycling Program

The Department of Sanitation's Newspaper Recycling "Rack" Program diverts used newspaper from the City's landfills and makes better use of this valuable resource.

The areas selected for the program fall within the following Sanitation Districts:

Brooklyn West	- Districts:	30,31,32,33,34,35
Richmond (S.I.)	Districts:	70,71,72,73
Queens West	- Districts:	50,51,52,53,54
Queens North	- Districts:	60,61,62,63,64

These areas are comprised of one, two and three family houses, usually with homeowners on the premises. It was felt that voluntary participation in the program would be maximized in such areas.

The residents are asked to separate newspapers from household refuse, bundle and tie them, then place them next to refuse containers for pick-up by Sanitationmen on normal collection days. Utilizing special racks built onto the under-carriage of collection trucks, Sanitationmen deposit the used newspapers into the racks and upon reaching disposal points, transfer them into containers located at various unloading sites in Brooklyn, Staten Island and Queens.

When a continer is full, it is weighed and carted by a private contractor to a recycling mill, which pays the City a per ton price determined by competitive bidding and keyed to newspaper market quotations.

As part of its effort to alert the public to the need for recycling newspaper, the Sanitation Department has distributed thousands of promotional leaflets into homes, placed campaign posters on its collection trucks and appealed to the media for promotional announcements and ads.

Efforts are underway by the Department's Newspaper Recycling Task Force to evaluate and improve the Rack Program, and to develop and implement other types of newspaper recycling programs in New York City. We are also considering applying for funding of additional equipment via the NYS Environmental Quality Bond Act (EQBA) - NYS DEC program for low-technology. This program allows funding of up to 50% of the capital and installation costs of equipment used in recycling and source separation programs.

6.1.2 Bureau of Archives* Paper Recycling Program

The Bureau of Archives operates a municipal source separation program for municipal office paper, #2 ledger, computer output paper, and data processing cards. We have informed Archives of the funding opportunities afforded by the EQBA - DEC program, described above. They are currently analyzing the feasibility of purchasing additional equipment such as fork-lifts, bins, balers, etc. utilizing EQBA funds. This may allow them to expand their present operation.

6.1.3 Council on the Environment Office Paper Recycling Program

As part of the City's application to US EPA under the Urban Policy Program, we have requested funds to initiate an office paper recycling program under the direction and management of the Council on the Environment of New York City (CENYC). They have experience in other environmental programs and are a logical organization to implement source separation

* This Bureau is part of the Dept. of Records & Information Services.

programs, since the Mayoral Executive Order establishing CENYC authorizes it to operate programs for pollution control and environmental protection and to receive grants for such programs. We believe that the experience and staff gained in their first venture will enable many future projects of a similar nature to be implemented.

6.1.4 Parks Department Recycling Projects

The Department of Parks is readying a proposal to recycle some of the solid waste discarded in city parks. They would start in Central and Prospect Parks and subsequently expand to other city parks. At present, solid waste is collected by Parks Department personnel and equipment with no recycling. The plan envisions continued collection, storage, separation and sale of recovered cans, paper and bottles under marketing agreements with dealers. Training programs are also being considered in conjunction with local interested community groups. Composting programs have also been discussed. Cultural Affairs*, by the way, is also considering the feasibility of installing a digester at the Bronx Zoo to convert probably the world's most exotic mixture of animal wastes into methane gas, which can be used for heating zoo buildings. They are considering applying for a grant to assess this proposal under the Department of Energy Appropriate Technology Program.

*The Department of Cultural Affairs is actually a distinct department, and not part of the Parks Department.

6.1.5 Wildcat Office Paper Recycling Proposal

Wildcat Services Inc. has also prepared a proposal for an office paper recycling program similar to the Port Authority operation in the World Trade Center, wherein Wildcat is providing the manpower, salaries and training for persons in that program.

This proposal for additional sites has not yet been presented pending informal discussions with the City. It is felt that Wildcat's resource of manpower might be utilized by one or more of the above mentioned programs. This might reduce some of the costs of the programs. These possibilities will be explored in proposed meetings with all the interested groups.

6.1.6 Environmental Action Coalition Recycling Proposal

EAC has prepared a proposal that envisions the implementation of a centralized recycling center and a number of satellite collection centers in the South Bronx, with attendant environmental education and outreach components. Most, if not all, of the elements in this proposal would be applicable to other areas in the City. We believe the ideas in this proposal have merit, and should be explored further either in conjunction with the second and third resource recovery projects, or as part of future funding requests from US EPA.

6.1.7 Role of Resource Recovery Task Force in Low Technology Program

A member of the Resource Recover Task Force is currently assigned full time to low technology and public participation programs. She will be available for advice on such projects to interested parties and will attempt to structure an informal coalition of all the organizations participating in low technology programs.

My intent is to encourage and catalyze these programs and to do what we can within our limited financial resources.

6.2 Waste Reduction

US EPA defines waste reduction as "prevention of waste at its source by redesigning products or changing the patterns of production and consumption." Some methods of achieving waste reduction include the following:

1. Reduction of the weight of products, e.g.
   a. smaller cars
   b. elimination of excessive packaging
   c. thinner walled containers
2. Development of more durable (longer-lived) products, e.g.
   a. high-mileage tires
   b. sturdy appliances
3. Substitution of re-usable products for convenience throw-aways, e.g.
   a. refillable beverage containers
   b. cloth vs. paper diapers
   c. re-usable vs. paper or plastic cups

Under the Resource Conservation and Recovery Act of 1976 (RCRA), a cabinet level Resource Conservation Committee (RCC) comprised of seven federal agencies was created to conduct a "full and complete investigation and study of all aspects of the economic, social, and environmental consequences of resource conservation." Resource conservation was defined to include "reduction of the amounts of solid waste that are generated and reduction of overall resource consumption."

Under this legislative mandate, RCC has initiated a series of studies to explore strategies to reduce waste. Among them are:

1. National beverage container deposits
2. National solid waste disposal charges
3. Resource recovery subsidies
4. Deposit/bounty policies for durable and hazardous products
5. National litter tax
6. Natural resource tax policies and federal transportation policies, i.e. inequities with regard to incentives to use recycled vs. virgin materials.
7. Direct product regulation

The published reports by RCC on national deposits for beverage containers and on national solid waste disposal charges make fascinating reading, especially the testimony developed during public hearings by directly affected interest

groups. Powerful arguments both pro and con can be marshaled to support or denounce these various strategies.

An overall economic argument offered in support of several of these strategies is that the price paid for a product is not the true social cost of the product. What is not included in the purchase price, or as economists would say - what is not internalized - is the ultimate cost of collection and disposal once the product or its packaging is discarded. Moreover, a consumer confronted with a choice between two competing products, has no direct way of knowing which product is truly more costly. He or she only sees the purchase price. The solid disposal charge attempts to internalize in the purchase price the ultimate cost of collection and disposal. Proponents of this strategy believe that if these costs were internalized, competitive forces would steer consumers to products that produce less waste.

The actual funds collected by the federal government under such a policy would be recycled back to local governments to offset the costs of collection, disposal, and capital required to build, say, resource recovery facilities. RCC remains neutral on overall recommendations to date, but is expected to present some interim conclusions in March, 1979. This policy seems to be extremely controversial on many levels, one of them being that the entire scheme to be administratively feasible, must be discriminatory in regard to what products should be assessed the disposal charge. Many people also feel

that it would essentially be a regressive excise tax, with poor people bearing the brunt of the overall social and economic impact.

With respect to the national deposit legislative proposal, RCC estimated that this policy would reduce the number of beverage containers in litter by 80%, and the total number of items littered by 20%. (Beverage containers are estimated to average 20 to 30% of all litter by item count and 40 to 60% on a volume basis.) A national deposit Bill could therefore reduce the volume of litter by as much as 40%. The absolute reduction in solid waste would be about 1.5 to 2% nationally. RCC has published conclusions on what is likely to happen if such a bill were passed, at least in some areas, but has not taken a stand on either supporting or opposing this policy.

It is interesting to note that New York City, in the early seventies, passed local legislation to tax beverage containers. The courts, however, declared the law unconstitutional because of discriminatory considerations.

Mandatory deposit legislation in New York City has also been introduced several times to City Council, but the legislation has never gone to fruition. Because of the potential adverse economic impacts on New York City, Mayor Koch favors such a bill at the state, regional or federal level.

While we obviously favor the institution of waste reduction measures, the consequences of any particular strategy can be exceedingly complex. Although piecemeal legislation

on a state by state basis does have value in showing that such policies can work, common sense would conclude that the basic questions and issues must ultimately be faced at the national level.

In this regard, we plan to keep abreast of the studies and conclusions of the Resource Conservation Committee, and to determine which of the many proposed strategies are in the City's best interest.

7.0 METHANE GAS RECOVERY PROJECTS

Landfills are the source of considerable quantities of methane gas, produced by the decomposition of refuse in the absence of air. Despite the fact that only 0.2% of a population's energy needs can be satisfied by methane recovered from its landfilled refuse, the absolute quantities of recoverable gas are nevertheless substantial, totalling about 7 trillion BTU per year in New York City. Efforts are underway to ascertain the technical and economic feasibility of extracting and utilizing the gas.

7.1 Fresh Kills Landfill

7.1.1 Reserve Synthetic Fuels (RSF) Project

RSF, a private California-based company, has a 20-year lease on a 400-acre portion of the Fresh Kills Landfill. According to terms of the lease, administered by the Resource Recovery Task Force, RSF has a 9-month period to conduct tests and evaluate the profitability of extracting gas and upgrading it to essentially pure methane which, under terms of an existing contract, would be sold to the Brooklyn Union Gas Company. RSF has such a facility in operation in California. At the end of the testing period in January, 1979, RSF has the option of cancelling the lease if it determines that the operation will not be profitable. If it proceeds, the City will receive 12.5% of the gross revenues obtained by RSF through sale of the gas. City revenues were initially expected to amount to approximately $200,000 per year.

Preliminary results of the testing program indicate that gas is produced in the Fresh Kills Landfill at a much higher rate than in California. Combined with an expected renegotiation of the sales contract, revenues to the City could range between one-half and one million dollars annually.

The following summarizes RSF's program schedule:

October 11, 1977	Lease started
December 5, 1977	Work halted because of bad weather
June 20, 1978	Work resumed
January 26, 1979	End of "9 month" testing program
February 26, 1979 *	Summary report & go-no-go decision due
September 26, 1980	Construction must begin
March 26, 1982	Construction complete

7.1.2 NYS ERDA, City, Brooklyn Union, DOE Projects

Upgrading landfill gas from 50% methane (as recovered) to essentially pure methane (as required for insertion into pipeline) is a risky business because a treatment plant is capital intensive and the gas contains components which may be corrosive. Other uses for the gas which require minimal pre-treatment are desirable, but need to be demonstrated both technically and economically. This is the aim of a program sponsored by the NYS Energy Research and Development Authority (NYS ERDA), with the City and the

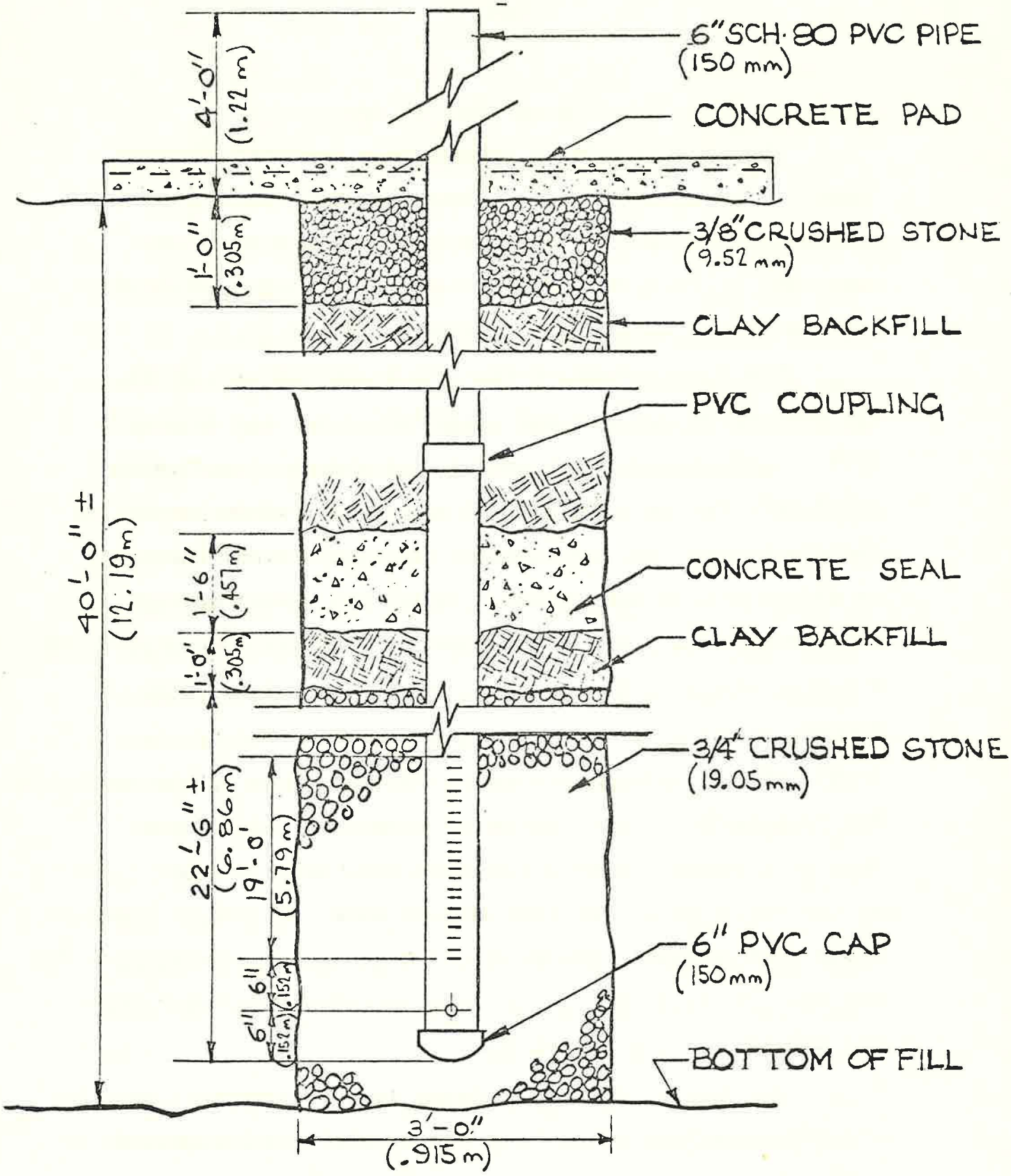
* RSF has made the decision to proceed with construction of the methane recovery facility.

Brooklyn Union Gas Company (BUG) as participants.

In late 1977, four 40-foot deep test wells were installed on a 40-acre demonstration site at the Fresh Kills Landfill in Staten Island. The area had been mounded to a height of 50 feet in two separate lifts, the first completed approximately 25 years ago and the last completed in 1976. The wells were connected by plastic piping; a vacuum pump and vent stack were also installed.

A gas pumping program conducted during May and June of 1978 included 24 hour operation for six weeks at various pumping rates, and with several combinations of wells tested for withdrawal rates. At maximum pump speed, a sustained flow rate of 146 cubic feet per minute was achieved when all four wells were operating in parallel; a maximum flow rate of 51.3 cubic feet per minute was achieved when one well was operated. Methane concentrations in the extracted gas ranged from 50 to 60% which translates to an energy value of 500-600 BTU per standard cubic foot.

Funding by NYS ERDA totalled $208,000 for this initial one-year project. The Brooklyn Union Gas Company designed the wells and collection system, supervised their construction, and conducted the pumping program. Only actual equipment and construction costs were reimbursed by NYSERDA. Consulting services and design work was done by the L.S. Wegman Co., Inc. under contract to NYSERDA. The NYCRRTF coordinated the project for New York City, also under contract to NYSERDA.



36" ϕ WELL INSTALLATION
(2 REQ'D)

FIGURE C: METHANE RECOVERY WELL DESIGN (36" DIAMETER HOLE)

The pumping program successfully demonstrated that landfill gas can be extracted in sufficient quantity to support further development efforts. These efforts are comprised of three components, designed to demonstrate the commercial application of extracted landfill gas.

The first component involves a continuation of the gas extraction test program performed in May and June of 1978. Optimum pumping rates and well radius of influence parameters will be refined utilizing a new vacuum pump and other equipment installed at the site. Simultaneously, an effort will be undertaken to model the normal methane generation and release rates from the landfill interior. A better understanding of these phenomena could provide further information on optimum pumping rates and on the length of well life. This work will be carried out by the New York State Health Department, drawing on experience they have gained in testing and modeling methane production at the West Valley, New York nuclear waste facility. Under a one year contract between NYS ERDA and NYS DOH starting November 15, 1978, $26,600 will be contributed by NYS ERDA and $13,280 in-kind by NYS DOH.

The second program component is a gas-firing test program. Landfill gas will be synthesized and combustion tests carried out in a variety of gas burners and appliances. The objective of the tests will be to determine the com-

bustion properties of raw landfill gas including the corrosive nature of the gas and the gaseous emissions produced. This information is vital if landfill gas is to be used as a fossil fuel substitute in existing boilers, or to attract industries which normally use natural gas as a process fuel. If the laboratory tests are successful, a field test program will also be carried out. This test program will run for a one year period starting November 30, 1978. BUG has contracted directly with NYS ERDA for $108,500 for materials, construction and testing, while the NYC RRTF is receiving $18,000 for general coordination.

The last component of the utilization program is a demonstration project of electricity generation at the test site using a gas-engine generator. The electricity will be used to supply part of the New York City Department of Sanitation electric demand at the Fresh Kills barge unloading facility. The objectives of this program are to demonstrate life cycle operation with the landfill gas. This project is sponsored by NYSERDA, the U.S. Department of Energy, the City of New York, and the Brooklyn Union Gas Company. The funding requested is as follows:

A. Cash Contributions:

DOE	-	$168,000	
NYS ERDA	-	100,000	
		$268,000	cash outlays
NYC RRTF share	-	$ 19,000	cash reimbursed

B. In-Kind Contributions:

RRTF	-	$ 15,000
Sanitation	-	56,000
BUG	-	55,000
		$126,000

C. Total Project Costs - $268,000 + $126,000 = $394,000

NYSERDA has been notified by DOE that the project has been selected for negotiation. The schedule envisions one year for design and installation of a 100 KW generating facility, and an additional year of testing and operation.

7.2 Fountain Avenue Landfill

The Fountain Avenue Landfill is owned by the U.S. National Park Service. A Memorandum of Understanding executed by the City and NPS in 1974 allows landfilling to continue until December of 1985, at which time the land will revert to federal control and be developed as part of the Gateway National Recreational Area. Development for methane recovery before and after 1985, is dependent on ownership of the gas. A preliminary opinion by the NPS indicates that methane recovery operations are not covered in the 1974 Memorandum of Understanding. A fuller inquiry has now been initiated.

One possible strategy is to amend the Memorandum to allow construction and operation of gas recovery equipment, and to allow gas rights to remain with the City after 1985.

The Brooklyn Union Gas Company has indicated that they will propose development of Fountain Avenue for gas recovery to the City in the near future. Other viable markets besides the Brooklyn Union gas mains are present in the area. The Starrett City housing complex, about half the size of Coop City, is less than a mile away. The Starrett total energy plant could be baseloaded by approximately half of the recoverable landfill gas.

7.3 Pelham Bay Landfill

This recently completed landfill can be immediately developed for recovery of methane gas. The 80-acre site, with refuse mounded to about 150 feet, is estimated to be capable of yielding an average of 90 million recoverable BTU per hour for the next 10 years, a figure which closely approximates base load heating and cooling requirements at Coop City, a large housing development located between one and two miles from the landfill. A preliminary economic analysis indicates that piping dried landfill gas to Coop City to displace natural gas and oil now burned on-site would be a cost-effective project.

Another possible market for upgraded landfill gas is the Con Edison natural gas distribution system. It is not known, however, if the mains in the vicinity of Pelham Bay are large enough to accommodate the potential supply.

With the City lacking capital funds, the most sensible approach is to allow development by the private sector or a utility. Con Edison has expressed interest, and the Resource Recovery Task Force is developing a Request for Proposals for general bidding. The Department of Sanitation Counsel is investigating several legal problems which are yet to be resolved: zoning, involvement of Department of Parks, franchise, etc. The franchise question is especially important if Coop City is specified as the market; bidding might be limited to the local gas utility.

8.0 CO-DISPOSAL OF SEWAGE SLUDGE AND REFUSE

Two hundred tons of digested sludge (on a bone dry basis) are currently generated each day in New York City as a by-product of the City's existing twelve sewage treatment plants. Sludge quantities are projected to increase to 400 tons per day by 1987 and to 500 tons per day by the year 2000. A slurry of this sludge at a concentration of approximately 3% solids is currently dumped at sea. However, the 1977 amendments to the Marine Protection, Research, and Sanctuaries Act (known as the Ocean Dumping Act) mandate the cessation of ocean dumping of sewage sludge by December 31, 1981. After that date, US EPA may not issue new ocean dumping permits or renewals. In addition, a civil penalty of up to $50,000 per day can be imposed on a municipality for non-compliance.

In response to this deadline, the New York City Department of Environmental Protection (DEP) retained Camp Dresser & McKee in December 1977 to prepare a Section 201 - Facilities Plan and an environmental assessment for both a Stage 1, or interim, solution* and a Stage 2, or long-range, solution to assist the City in implementing a program to replace ocean dumping of its sludge by a more environmentally sound method.

A draft report for the interim solution was released in September 1978. The Stage 2, or long-range, solution facilities plan and attendant environmental assessment statement are due for submission to DEP in September, 1979.

* An interim solution was deemed necessary because the permanent long-range facilities cannot be operational by the target date of December 31, 1981.

In brief, the interim solution recommends the construction of three composting plants at the following sites: Fresh Kills, South Shore Incinerator area, and College Point Industrial Park. * The input to the composting plant will be dewatered sludge, which will be accomplished by chemical addition of lime and ferric chloride and plate and frame filter presses at two dewatering sites: floating pontoon platforms moored at the piers of the Bowery Bay and Owl's Head water pollution control plants. The cured compost will be used for land reclamation including soil enrichment of parklands, landfills, industrial renewal areas and similar publicly-dedicated open, uninhabited, and underdeveloped lands. Some of the identified applications include Ferry Point Park, South View Park, Pugsley Neck, Pelham Bay Landfill, Fresh Kills, Idlewild, Edgemere, Spring Creek Park, Fountain Avenue Landfill, Carnarsie Beach Park, and Drier Offerman Park.

The capital cost of this interim program is estimated to be $250 million, of which, 87.5 to 92.5% is reimbursable through the EPA and State construction grant program. Estimated annual costs (City borne) are $30 million. This should be compared to the City's present annualized capital and operating costs for sludge disposal by ocean dumping of approximately $2 million.

Among the technologies suitable for a long-range solution to sewage sludge disposal is a technique called co-disposal.

Basically, this is the combustion of sludge, usually dried to some extent, together with refuse or a fossil fuel. Co-disposal can be accomplished in the City in existing refuse incinerators,

*DEP is considering the following alternative sites: Hunts Point to replace College Point and Bowery Bay; and the Brooklyn Army Terminal to replace Owl's Head and South Shore.

in future refuse-to-steam resource recovery plants, and in coal-burning power plants (PASNY).

A number of potential problems must be addressed before co-disposal can be implemented. Some of these are:

(1) Effect on air emissions, particularly heavy metals such as mercury, lead and cadmium, and ability of control system to handle these emissions.

(2) Degree of sludge drying required

(3) Deleterious effects on furnances and other equipment.

(4) Effect on solid waste throughput (in incinerator and refuse-to-steam plants).

The Camp Dresser and McKee Stage I report recommends that a test program be carried out at the Southwest Brooklyn Incinerator to resolve these problems. The testing would start during the latter part of 1979 when sufficient quantities of dewatered sludge should be available. The Southwest plant will be the only D.S. incinerator in operation at that time with upgraded furnaces and new air pollution control facilities installed. It is estimated that a comprehensive test program can be conducted for about $1,000,000.

Also under consideration for Southwest Brooklyn is an evaluation program for burning wet sludge with the refuse. The physical modifications to implement this alternative would be considerably less than those required for preliminary sludge drying, but the maximum sludge throughput in the area of 5 tons per

day dry sludge per 250 tons per day furnace) is expected to be a limiting factor. In contrast, it is expected that a single large refuse-to-steam plant (2000 to 3000 tons per day), or the proposed 700 MW PASNY coal-fired power plant, could easily consume all of the City's sludge.

Should the Southwest Brooklyn Incinerator tests demonstrate that co-disposal is a technically, economically and environmentally sound alternative, planning for each future resource recovery facility will include an assessment of whether or not sludge disposal should be included.

9.0 SITING AND REGULATORY CONSIDERATIONS

9.1 Siting of Resource Recovery Facilities *

The institutional constraints created by the New York City Charter and Administrative Code are discussed in this sub-section. They include the Uniform Land Use Review Procedure (ULURP), a charter provision for the orderly review by a variety of levels of city government of proposed land use projects; the Alienation of Land Section of the Charter, a stipulation which prohibits land uses on city property that alienate the intended use of that property; zoning provisions of the City Zoning Resolution that constrain the siting of facilities; and Site Acquisition, the actual procedures that would have to be followed to acquire a site.

The Uniform Land Use Review Procedure Section 197-c of the City Charter (ULURP), requires a standard review for any project respecting the use, development or improvement of real property subject to City regulation. The procedure applies to changes, approvals, contracts, consents, permits and authorizations relating to site selection for capital projects and for the sale, lease (other than the lease of office space), exchange, or other disposition of real property to the City and of the real property of the City.

We expect that most, if not all, resource recovery projects will be subject to ULURP.

*The material in this section was abstracted from the Camp Dresser & McKee sludge study.

This process typically requires approximately nine months for completion -- three months in precertification activities, preparing and certifying the application, and six months in the actual review procedure.

The process is as follows. First, for a particular site, a ULURP application and an associated Environmental Assessment are submitted to the City Planning Commission (CPC) requesting that the Application be certified and that the ULURP begin. CPC refers the application to the Department of City Planning staff and to the Department of Environmental Protection (DEP) and requests from them a Negative Declaration -- a statement which asserts that there will be no major adverse environmental impacts associated with the project.

The Negative Declaration from DEP and the CPC would be issued in compliance with the State Environmental Quality Review Act, and would be issued concurrently with an EPA Negative Declaration, if required. During the review of the Environmental Assessment, the application is also submitted to the Land Review Committee (in addition to the City Planning Commission staff) for general review. The purpose of the review is to assess the completeness of the application and to identify any issues that have been inadequately addressed. The Land Review Committee is chaired by the CPC and is composed of representatives of the Real Estate Department, the Office of Management and Budget, the President of the City Council, the Comptroller, the President of the

Borough in which sites are to be located and anyone else who may be invited by the Land Review Committee to sit on the Committee. Upon the issuance of the Negative Declaration and the completion of the general review by the Land Review Committee, the application is then referred back to the CPC, and is certified by the CPC -- that is, it is approved as being a complete application and the actual review process under ULURP can begin. Certification can easily take three months.

The actual ULURP will take at least six months. The application is referred by the CPC to the Community Board which has two months to hold a public hearing and prepare a recommendation. It is then returned to the CPC, which has two months in which to prepare its recommendation. Finally, it is referred to the Board of Estimate, which has two months to prepare its decision. The final result of ULURP would be the acceptance or rejection of the site by the Board of Estimate.

Allienation of Land. Certain land uses in New York City are inalienable, that is, they cannot be used for any other purpose than those for which they were acquired:

> "The rights of the City in and to its water front, ferries, wharf property, bridges, land under water, public landings, wharves, docks, streets, avenues, highways, parks and all other public places are hereby declared to be inalienable..."

Under the proper circumstance, however, inalienable land is usable for other purposes:

> "Nothing herein contained shall prevent the granting of franchises, permits, and licenses in respect to inalienable property."

This statement to the City Charter is general and does not differentiate between the different land use and what is considered an alienation of land use. The definition of alienation has been developed in case law. City parkland is held in trust; and, as determined in case law, to "de-park" a park requires state legislation. With respect to parkland, we will have to resolve the legalities of installing methane recovery systems at one or more landfills that are mapped as parks.

Zoning. The City's Zoning Resolution is administered by the Department of Buildings, the Department of Ports and Terminals, the Board of Standards and Appeals, the City Planning Commission and the Board of Estimate. The prime responsibility for enforcement lies with the Department of Buildings, or Ports and Terminals if the land is along the water-front. Amendments to the Zoning Resolution, zoning map changes, and special permit applications (with the exception of Board of Standards and Appeals Permits) are initiated only by the City Planning Commission under Section 200 of the Charter or by the property owner under Section 201.

Resource recovery facilities utilizing combustion are allowed in M-3 districts by right, but siting of such facilities in any other district would require a change to the zoning resolution or a variance to the resolution.

Zoning requirements for refuse derived fuel facilities will have to be researched. Variances and Zoning changes are subject to ULURP.

Obtaining a variance is a feasible but sometimes unattractive option. Variances are subject to review by the Board of Standards and Appeals whose decisions, in turn, can be appealed. Since the variance required may be controversial, it is quite possible that, if granted, it would be appealed, which could require an unspecified amount of time to resolve.

A Zoning change also has its problems since it requires the ULURP application to be referred to all community planning districts in the City.

Site Acquisition. There is a variety of ways by which sites may be acquired for City use. If the designated sites are on City land, a simple transfer between agencies could be effected. If the site is privately held and the land is for sale, the City could purchase the property and the Real Estate Department could assign it for use. If the site must be taken by condemnation and has no existing activity on it, then approximately two months (as estimated by the City Law Department) would be required before the site could become City property. If condemnation is required and the site is occupied, then an additional six months would be required. ULURP

is required to precede all of the above except in the case of the transfer of property between City agencies.

For a City-owned site, the Department of Real Estate would determine its present use, any associated conditions for use, and the agency to which it is assigned. In turn, the Law Department should be requested to determine if any legal constraints would restrict the use of the land. If there were no problems, a transfer of the property could be effected between the two agencies involved. The transfer of City-owned property between two City agencies can be performed quickly (one to two months). To date, ULURP is not required for the transfer of land between City agencies. With some transfers, ULURP is advisable; and it is speculated by many City officials that eventually ULURP would be required for such transfers.

If the property is privately owned, the process is more complicated. The site could be acquired by negotiation, assuming the owner is willing to sell the property. If the owner is not willing to sell the property, it would have to be condemned. (Condemnation requires Board of Estimate approval preceded by ULURP and the allocation of capital funds before condemnation.) The Mayor would then order the property to be taken, and the Law Department would effect the condemnation.

Condemnation, exclusive of the nine months of ULURP, can require as little as two months, if the taking is for a high priority project. If the property is occupied,

condemnation would also require that a writ of assistance be obtained, which allows the City to take possession of the property. This could take as much as eight to nine months, depending on the extent to which the property was occupied. "Occupied" would have to be defined by Law Department attorneys when sites of interest have been identified.

9.2 Regulatory Requirements

There are many permits and regulatory reviews at the federal, state and local level required to construct a resource recovery facility. Some of the possible permits required are as follows:

From New York State Department of Environmental Conservation:

Solid Waste Management Permit - Section 360 - required for all solid management facilities.

SPDES (NPDES) Permits - For any effluent discharges not discharged to local sewers or treatment plants

Water Quality Certification - Section 401 - For any potential sources of degradation of local water quality

Spill Prevention and Control Program - In conjunction with Section 401 certification

Dock Construction Permit - For any dock construction

Dredge Permit - For any maintenance dredging required

Indirect Source Permit - For any sizable number of trucks used to transport refuse to the facility or for large parking lots.

From the Corps of Engineers:

Section 10 Permit - For any construction in or structures in navigable waters

Dredge Permit - For any dredging required

From Local Permitting Agencies:

Work and construction permits from a variety of City Departments

From Other Agencies:

A variety of permits and approvals from agencies such as the F.A.A., F.C.C., U.S. Coast Guard, and DEP, DEC, and EPA with respect to air quality.

In addition, certain environmental review procedures must be followed in order to have a site designated as acceptable. Concurrently with the Environmental Protection Agency (EPA) review, the state environmental review procedures must be met, in accordance with the State Environmental Quality Review Act. The state procedure would supersede the City review. The concurrent state and federal reviews can be effected by publishing in all public notices that the hearings are to satisfy the requirements of both N.E.P.A. and the State Environmental Quality Review Act.

All of the state permits are subject to the provisions of the Uniform Procedures Act which stipulates time schedules by which the appropriate state agencies must act upon any request for a particular permit. Typically, the period allowed is 90 days, with an additional 60 days allowed if a public hearing is required.

Finally, all federally funded actions are subject to A-95

review. The A-95 process, which takes its name from Circular A-95 of the U.S. Office of Management and Budget, is a review procedure where a regional agency, generally the regional planning agency reviews any major federally funded proposed project. The review is to assure compatibility with other plans and proposed projects and to assure compliance with environmental controls and objectives. In the case of New York City projects, the Tri-State Regional Planning Commission is the A-95 review agency.

The Clean Air Act Amendments of 1977 established a federal (although eventually state run) process for obtaining a construction permit for a new air pollutant emission source. It is expected that a New Source Review Application will be required for any resource recovery facility utilizing combustion, such as a refuse to steam plant. This process is expected to be intricate, complex and lengthy. A well thought out plan will be essential to avoid delays or reversals.

10.0 PUBLIC PARTICIPATION PROGRAM

10.1 Program Goals

Solid waste management is one of the basic life-support functions of a society. Every New Yorker contributes to the City's garbage problem and every one of us, in a sense, has a general stake in and obligation to assist in its solution. We welcome that assistance and will provide opportunities for public participation in the overall decision making process.

Bureaucracies, as we all know, do have a tendency to operate behind closed doors, to make expedient decisions under the pressure of schedules that are not always in the public interest. I want to avoid this and to, above all, implement solutions that are not only technically, fiscally, and environmentally sound, but ones that are socially and publically acceptable.

Achieving this goal requires that the bureaucratic doors be left open, that our proposals stand up to public scrutiny and criticism, that they be modified where necessary to reflect public concerns. Anything less is doomed to failure.

Moreover, I am cognizant of the vast pool of resources in this City. An army of articulate, knowledgeable and dedicated environmentalists, for example, have waged a struggle for a decade to improve conditions here. Their expertise, advice and energy will be sought and brought to bear on this program. In addition, we have heard

repeatedly the offer, "What can we do to help?" from private firms, from elected officials, from state and federal agencies, from public and regional authorities, from Wall Street, from universities and foundations, from community and civic groups, from utility companies, from financing authorities, and finally from a large number of unaffiliated, average New Yorkers.

These resources must be organized, focused and channelled. As a first step, I have directed that a Resource Recovery Advisory Committee be formed to help in the monumental task before us.

10.2 Resource Recovery Advisory Committee

Any list has its problems; someone or some group is inadvertently left out. Nevertheless, as a first cut, we have identified persons and organizations that will be contacted to join the committee, and these are listed below. Persons or organizations desiring to be part of this committee should contact:

Thomas D. Hamill, P.E.
Executive Director
NYC Resource Recovery Task Force
51 Chambers Street, Room 830
New York, NY 10007

The Advisory Committee's main function will be to insure that the Administration and City staff obtain input and feedback from a broad crosscut of possible constituencies affected by the program. Other functions, such as dissemination of information, outreach, publicity and education programs, and formal interface mechanisms will be identified and established as a joint effort.

GOVERNMENT

New York City

Mayor's Office
Office of Management and Budget
Board of Estimate: Mayor
Comptroller
President of the City Council
Borough Presidents

City Council

City Planning Commission

Department of Ports and Terminals

Department of Parks and Recreation

Department of Health

Department of Environmental Protection

Community Boards and District Managers

Community Board Coordinators, Office of the Borough President

Consulting Engineers, 5 Boroughs

Council on the Environment of NYC

Law Department

Legislative Office of Budget Review

Office of Economic Development

Regional, substate

Metropolitan Regional Council

New York State

Legislative representatives: Senate and Assembly

Department of Environmental Conservation

Department of Transportation

NYS Resource Recovery Task Force

Department of Commerce

New York State - Continued

Department of State CZM

Environmental Facilities Corp

Office of Energy

Public Service Commission

PASNY

Urban Development Corporation

Westside Highway Project

Federal

US Environmental Protection Agency

US Department of Energy

US Department of Commerce

Corps of Engineers

2 U.S. Senators

Congressional Delegation

Regional

Tri-State Regional Planning Commission

Interstate Sanitation Commission

Port Authority of New York and New Jersey

INTEREST GROUPS

Academic community

American Conservation Association

American Iron & Steel Institute

Association for a Better N.Y.

Bedford-Stuyvesant Restoration Corp.

Bronx Council for Environmental Quality

Bronx Frontier

Citizens Committee for NYC Inc.

Citizens Committee to Keep N.Y. Clean

Citizens for a Better Environment, Inc.

Citizens for a Better New York

Citizens for Clean Air

Citizens Union

CLICK Corp.

Community Service Society

Environmental Action Coalition of NYC

Environmental Defense Fund

Federation of Block Associations

Friends of the Earth

Institution for Public Transportation

Institute of Scrap Iron and Steel

League of Women Voters

National Association of Recycling Industries

National Audubon Society

National Center for Resource Recovery

National Urban League

National Resources Defense Council

New York City Chamber of Commerce

New York Public Interest Research Group

NYS Association for Solid Waste Management

Recycling Council of Greater New York

Regional Plan Association

Scientists Committee for Public Information

Sierra Club, Atlantic Chapter

Urban League (New York)

Wave Hill Center for Environmental Studies

Wildcat Corp. Inc.

Women's City Club, Environmental Committee

Utilities

Consolidated Edison, Company

Brooklyn Union Gas, Company

In addition, recycling and resource recovery firms and members of the financial community will also be notified.

11.0 CONCLUDING REMARKS: OVERALL ENVIRONMENTAL PLANNING AND MANAGEMENT

It is clear from the foregoing discussions that the planning and implementation of a comprehensive solid waste management system for New York City will be a complex endeavor. Economic and institutional considerations make the present solid waste program unlike any previous program in this area. In addition, more than ever before, strong coordination of the solid waste program with parallel programs in water and air pollution control will be required. Fortunately, a mechanism for accomplishing this, will be instituted in the near future. The mechanism is basically an extension of the "State/USEPA Agreement", now used in the water pollution control program, to include solid waste management.

Beginning in federal fiscal year 1980, State/EPA agreements will mandate integrated approaches to solving water supply, solid waste, and water pollution control problems. A Concept Paper describing the basic policies and procedures for developing and implementing State/EPA agreements for any program funded by the Clean Water Act, RCRA, or the Safe Drinking Act (a covered program) was released by US EPA on October 27, 1978. Interim final regulations, expected to be published in February 1979, will clarify requirements and ensure consistency between programs.

As envisioned by US EPA, the State/EPA Agreement will be the basic management tool in such programs, reflecting important decisions of the State (and municipalities therein) and US EPA on environmental problems, priorities, timing of solutions, responsibilities, funding, and allocation of resources. It will document environmental objectives and outline the overall work plan required to achieve such objectives. Beginning in federal FY 1980, all covered programs must be part of the State/EPA Agreement.

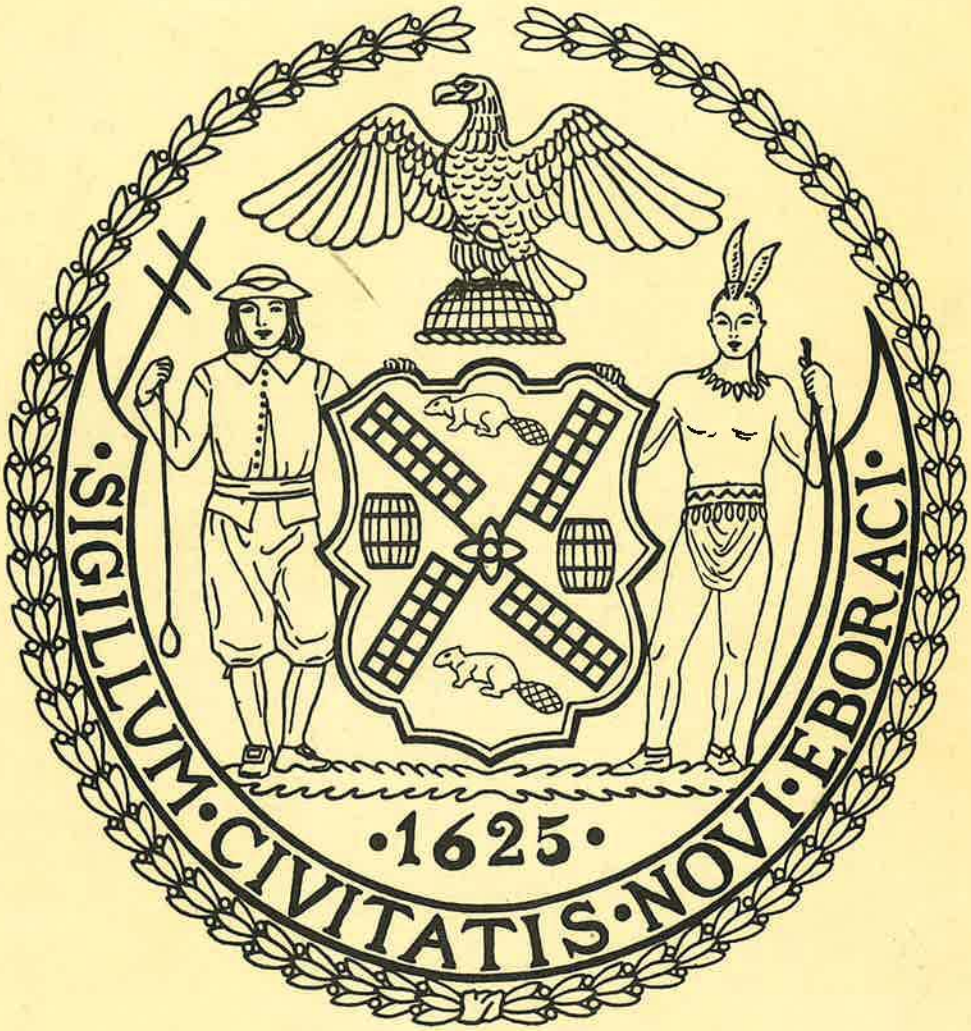
We consider the inclusion of solid waste programs in the State/EPA Agreement an important and beneficial development. We expect that many of the issues, questions and problems previously referred to in this report will become elements for study and resolution in a State/EPA Agreement, and we are prepared to work closely with the State DEC Commissioner and US EPA Regional Administrator to accomplish this.

We believe this approach will crystallize thinking, focus objectives, expedite funding, facilitate management, integrate solutions, and avoid piecemeal and duplicative efforts in achieving our goals.

One final word. On one side of a complex coin are the host of large and challenging problems previously discussed. But on the other are a set of intriguing social, economic and environmental benefits. Flipping that coin will be no easy task.

But we have set a new direction, with strong, committed leadership and staff. And I believe this is the key to accomplishing our goals in a program whose final outcome will contribute greatly to the quality of life in New York City.

* * * *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