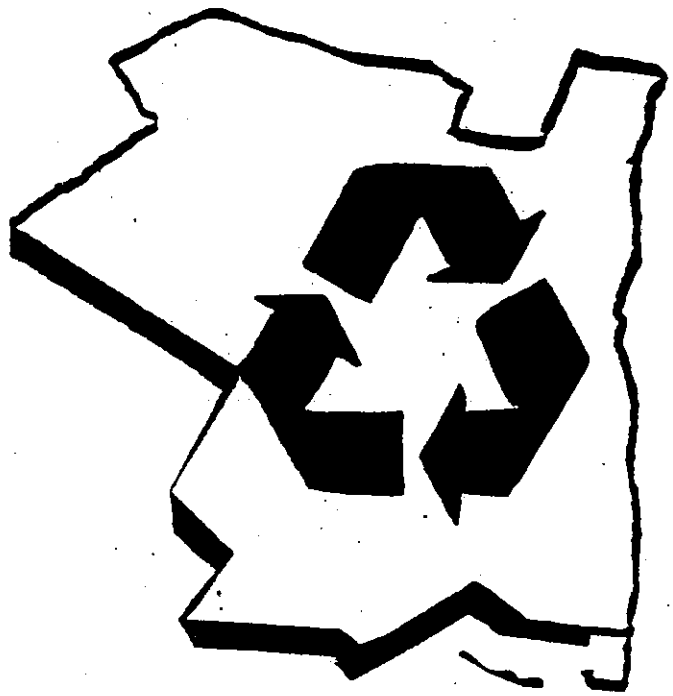
ULSTER COUNTY

FINAL

SOLID WASTE MANAGEMENT PLAN



and

FIRST MODIFICATION
INTERIM SOLID WASTE MANAGEMENT PROGRAM

VOLUMES I and II

Prepared - October, 1991
NYSDEC Approved - December, 1991
Modified - August, 1992
(Changes Incorporated Herein and in Volume II)

ULSTER COUNTY RESOURCE RECOVERY AGENCY
SEAL OF ULSTER COUNTY
STATE OF NEW YORK
1987

Ulster County Resource Recovery Agency

52 Main Street, U.R.C., P.O. Box 4298
Kingston, New York 12401
(914) 339-1223

1987

DATE: July 23, 1992

TO: Stephen Betts, NYSDEC Division of SW Albany
Penny Cioffi, NYSDEC Division of SW Albany
Richard Gardineer, NYSDEC Region III New Paltz
Perry Mehta, NYSDEC Region III New Paltz
Stephen Parisio, NYSDEC Region III New Paltz

FROM: Charles P. Shaw, Executive Director Charles Shaw

RE: Modifications of the Ulster County Solid Waste Management Plan - Solid Waste Management Planning Grant Contract No. C809021, as amended

This memo is intended to be a "road map" that should allow you to more easily review the Ulster COunty Resource Recovery Agency submission for approval of a Modification to the Approved Ulster COunty Final Solid Waste Management Plan. The format used for this submission follows the format outlined in the NYSDEC's Division of Solid Waste "Guidance Document for Modification fo DEC approved Solid Waste Management Plans (SWMPs) and as in accordance to 6NYCRR 360-15.11.

This submission consists of:

- **Volume I - "Ulster County Final Solid Waste Management Plan"** prepared in October, 1991 and approved by NYSDEC in December, 1991. The following textual changes have been incorporated into Volume I as required by the NYSDEC Guidance Document for Modifications of SWMPs.

  1) **The Final SWMP** cover has been revised to clearly indicate that the Plan has been modified;

  2) **The Table of Contents** has been revised to reflect all revisions. The words "Modified 8/92" have been included after each section where a textual change occurs.

  3) **The Executive Summary** has been revised to reflect the proposed modifications.

4) **Each chapter** of Volume I that is impacted by the modification was updated and revised (i.e., narratives, tables, charts, etc.). All textual revisions occur in bold print, are underlined, and the words "Modifications added/deleted 8/92" denoting the change has been included in the left hand margin on the appropriate page.

5) **Chapter 9, The Implementation Chapter** - Chapter 9.0 was most impacted by the modification and required the most extensive revisions. In addition to textual changes made to pages 9-47 through 9-54 and 9-63A, Volume II - First Modification to the UC SWMP was prepared to provide further detail regarding the Proposed Modifications. Volume II is referenced in Chapter 9, Section 9.3.11, page 9-50A.

o **Volume II - "First Modification to the Ulster County Solid Waste Management Plan"** - "The Interim Solid Waste Management Program and Landfill Consolidation Plan" (prepared May, 1992). Volume II consists of:

- Short Environmental Assessment Form;
- Exhibit 1 - To Environmental Assessment Form;
- Attachment A - Landfill Consolidation Plan;
- Attachment B - Proposed Modifications to the SWMP;
- Attachment C - SWM Agreement Between UCRRA and Municipalities;
- Attachment E - Tipping Fee Projections;
- Attachment F - Public Participation Process.
- Attachment G - Response to Public Comment on the Interim Solid Waste Management Program

Volume II contains the information and documentation required for a modification according to the criteria listed in the NYSDEC "Guidance Document for SWMP Modifications", Sections IIIA through IIIF. In particular:

A) A detailed description of and reasons for the Proposed Modifications can be found in Volume II, Attachment A Landfill Consolidation Plan;

B) A description of changes between the proposed modifications and existing DEC approved SWMP can be found in Volume II, Attachment B, Proposed Modifications to the SWMP. Also, Volume I, The Final SWMP has been revised to reflect these textual modifications.

A comparative description of environmental, economic, and social impacts can be found in Volume II, Exhibit 1, to the Environmental Assessment Form and in Volume II, Attachment A, Landfill Consolidation Plan, Chapters IV and V.

Benefits to the Planning Unit can be found in Volume II, Attachment A, Landfill Consolidation Plan, Chapter III, and in Volume II, Exhibit 1 to the Environmental Assessment Form, pages 14-20.

Cost comparison, including construction, can be found in Volume II, Attachment A, Landfill Consolidation Plan, pages 6-7, and in Volume II, Attachment E, Ulster County Resource Recovery Agency Tipping Fee Projections for 1993-1997.

C) Implementation schedule including the structure of management and administrative responsibilities of the Proposed Modified Plan is found in; Volume II, Attachment A, Landfill Consolidation Plan, Chapter IV, and in Volume II, Attachment D, Modified Orders on Consent.

D) SEQRA determination, public notification, and public participation process is found in Resolution No. 206, Determination of Significance and Authorization to Issue a Negative Declaration (attached to the cover letter for this submission), in Volume II, Exhibit a to the Environmental Assessment Form, in Volume II, Attachment F, Public Participation Process, and in Volume II, Attachment A, Landfill Consolidation Plan, Chapter VII.

E) A description of how the Planning Unit will ensure that the modification, upon NYSDEC approval, will be made to all official copies of the existing NYSDEC approved SWMP will be discussed with NYSDEC staff for final determination. Basically, Volume II and a set of replacement pages for Volume I will be distributed to holders of all official copies.

F) The resolution adopting the Modification is Resolution No. 207 RE: Adoption of Modifications to Ulster County Solid Waste Management Plan, and is attached to the cover letter requesting this modification.

A summary of all comments to the SWMP Modification Public Hearing which was held on May 28, 1992 can be found in Volume II, Attachment G, Response to Public Comment on the Interim Solid Waste Management Program.

I trust this has been of some assistance in facilitating your review of this submission. If you have any questions, please feel free to call me at (914) 339-1223 at any time.

Thank you for your kind attention to this matter.

ULSTER COUNTY RESOURCE RECOVERY AGENCY

RESOLUTION NO. 206

Re: Determination of Significance and Authorization to Issue a Negative Declaration Pursuant to the State Environmental Quality Review Act Regarding the Interim Solid Waste Management Program and Authorization of Issuance of Negative Declaration Thereon

WHEREAS, the Ulster County Resource Recovery Agency (the "Agency") has conducted a review pursuant to Article 8 of the Environmental Conservation Law and 6 NYCRR Part 617 (collectively "SEQRA"), on the subject of solid waste management in Ulster County, including the following specific issues: adoption of a solid waste management plan; implementation of a County-wide recycling plan; selection of solid waste disposal technologies; and implementation of host community benefit programs for municipalities affected by Agency-owned facilities, and

WHEREAS, by Resolution No. 103 adopted on June 21, 1990, a Final Environmental Impact Statement and Supplemental Final Generic Impact Statement (the "Final GEIS and Supplemental Final GEIS") were authorized and subsequently duly filed, and

WHEREAS, Agency members, staff and consultants reviewed the Final GEIS and Supplemental Final GEIS, the proposed actions contemplated therein, the alternatives to those actions, the environmental, social and economic impacts of those actions, the measures available to mitigate the impacts of those actions, and the comments of the public and other involved or interested agencies, and

WHEREAS, the Agency held public work sessions to review and discuss a findings statement in connection with the above, and

WHEREAS, the Agency drafted and reviewed a findings statement, (the "Findings Statement") which was developed by the Agency members, Agency staff and Agency consultants during the process described above, and

WHEREAS, by Resolution No. 113 adopted on September 20, 1990, the Findings Statement was adopted, and

WHEREAS, by Resolution No. 139, the Agency issued additional findings concerning the following areas:

- miscellaneous recyclables,
- regulated medical waste,
- household hazardous waste,
- construction and demolition debris,
- sewage sludge management,
- municipal organic solid waste composting,

- municipal solid waste processing,
- municipal landfill closure,
- recycling markets survey,
- commercial and industrial recycling, and

WHEREAS, such additional findings supplement the Findings Statement and are based upon the Final GEIS, Supplemental GEIS, Findings Statement and other proceedings had herein, including commentary by the Ulster County Legislature and the New York State Department of Environmental Conservation, and

WHEREAS, by Resolution No. 141, the Agency adopted and approved the Comprehensive Solid Waste Management Plan for the County (the "Plan"), and

WHEREAS, pursuant to Resolution No. 151 of 1991, the Ulster County Legislature approved the Plan and issued findings thereon, and

WHEREAS, on December 3, 1991, the New York State Department of Environmental Conservation approved the Plan and issued findings thereon, and

WHEREAS, the Agency has begun to implement the Plan, including the development of an interim solid waste management program (the "Interim Program") an action which consists of several related components to provide for solid waste management from the time of Plan adoption until operation of the County-wide Part 360 Landfill and other permanent facilities, and

WHEREAS, the components of the Interim Plan are specifically detailed in the annexed environmental assessment form with exhibit and attachments ("EAF") and summarized below:

- modification of the SWMP under the New York State Department of Environmental Conservation ("NYSDEC") guidelines to provide for the interim solid waste management program

- adoption of a Landfill Consolidation Plan ("LCP") which analyzes the existing municipal landfills under NYSDEC consent orders, provides for closure of the landfills in an orderly fashion, and designates three landfills (the Consolidation Landfills) to be taken over and operated by UCRRA for the benefit of the entire County during the Interim Period.

- acquisition of the Consolidation Landfills under agreements to be negotiated with the respective municipalities.

- negotiation of agreements with the remaining municipalities for solid waste management service

by UCRRA.

- development of a landfill closure assistance program ("LCAP") whereby UCRRA would pay a portion of the closure costs of the non-consolidation landfills. The LCAP would be funded by issuing revenue bonds under the UCRRA's financing plan.

- execution of revised Consent Orders with NYSDEC and the Consolidation Landfill towns for operation and closure of the Consolidation Landfills.

- development of the financing plan and issuance of revenues bonds, and

WHEREAS, the EAF, which fully describes each of the components of the Interim Program and analyzes the environmental effects of each, was prepared by Agency staff upon authorization of the Agency by Resolution No. 195 and Section 6.2.2 of the Findings Statement and the final EAF was provided to the Agency members on May 15, 1992,

WHEREAS, the components of the Interim Program have been subjected to a rigorous public review process more specifically described in Appendix "F" to the EAF, and including a public hearing convened on May 28, 1992 and extended for receipt of written comments until June 11, 1992, the minutes for which are annexed to this resolution, and

WHEREAS, a response document was prepared by Agency staff addressing the comments received at the hearing which response document is annexed hereto, and

WHEREAS, the Agency has reviewed the components of the Interim Program, the EAF and the previous proceedings had by the Agency described above including the GEIS, Findings Statement, and the Plan, and

WHEREAS, the Agency is prepared to determine that the Interim Program (the "Action") is subject to SEQRA, constitutes an unlisted action under SEQRA, carries out and implements the goals of the approved Plan and Findings, will not have a significant effect on the environment and that a negative declaration should be issued thereon,

NOW, THEREFORE, BE IT

RESOLVED, by the Ulster County Resource Recovery Agency as follows:

Section 1. Upon review and consideration of the EAF, the GEIS, the Findings, its Plan and the public record established herein, the Agency, as lead agency, hereby finds and determines as follows:

1. The action is subject to SEQRA and is an "unlisted action".

2. The action carries out and implements and is fully compatible with the policies and goals of the Findings and the Plan.

3. The action will not have a significant effect on the environment, specifically:

   1. The Action will not result in any substantial adverse change in existing air quality, ground or surface water quality or quantity, traffic or noise levels. Nor will there be an increase in the potential for soil erosion, flooding, leaching or drainage problems. The Action will improve ground water quality and surface water quality in that the Consolidation Landfills will be operated and closed under stricter 6 NYCRR Part 360 standards and closure of the other existing non-complying solid waste landfills in the County will be coordinated, occur sooner under the action and will benefit from funds in the LCAP. There will be no substantial increase in solid waste production (in fact a decrease is expected due to recycling) and the increase in truck traffic at the Consolidation Landfills will be minimal, in the range of 5-15 additional truck trips per day.

   2. The Action will not result in the removal or destruction of large quantities of vegetation or fauna; substantial interference with the movement of any resident or migratory fish or wildlife species; impacts on a significant habitat area; substantial adverse effects on a threatened or endangered species or animal or plant, or the habitat of such a species; or other significant adverse effect to natural resources.

   3. The Action will not encourage or attract a large number of people to a place or places for more than a few days, compared to the number of people who would come to such place absent the Action.

   4. The Action will not result in the creation of a material conflict with a community's current plans or goals as officially approved or adopted. Actually, it will help facilitate and expedite the implementation of the goals set forth in the SWMP.

5. The Action will not result in the impairment of the character or quality of important historical, archeological, architectural, or aesthetic resources or of existing community or neighborhood character.

6. The Action will not result in a major change in the use of either the quantity or type of energy.

7. The Action will not create a hazard to human health. It will instead protect human health by providing for the coordinated closure of non-complying landfills and the closing of Consolidation Landfills under stricter standards.

8. There will be no substantial change in the use, or intensity of use, of land including agricultural, open space or recreational resources, or in its capacity to support existing uses. Existing footprints of existing landfills will be used only up to their capacity. The increased amount of waste to be disposed of at the Consolidation Landfills beyond that originally planned will be disposed of in accordance with the stricter operation and closure requirements of 6 NYCRR Part 360.

9. The Action will not result in the creation of a material demand for other actions which would result in one of the above consequences.

10. There will not be changes in two or more elements of the environment, no one of which has a significant effect on the environment, but when considered together result in a substantial adverse impact on the environment.

11. There are not two or more related actions undertaken, funded or approved by an agency, none of which has or would have a significant effect on the environment, but when considered cumulatively, would meet one or more of the criteria in this section.

4. A negative declaration in substantially the same form and substance as annexed hereto be approved and the Executive Director be authorized to take all necessary steps to process and file said negative declaration.

Vote: Ayes 4 Nays 0

Date: June 18, 1992

617.21
Appendix F
State Environmental Quality Review

NEGATIVE DECLARATION
Notice of Determination of Non-Significance

Project Number: None

Date: June 18, 1992

This notice is issued pursuant to Part 617 of the implementing regulations pertaining to Article 8 (State Environmental Quality Review Act) of the Environmental Conservation Law.

The Ulster County Resource Recovery Agency, as lead agency, has determined that the proposed action described below will not have a significant effect on the environment and a Draft Environmental Impact Statement will not be prepared.

Name of Action: Approval of Interim Solid Waste Program

SEQR Status:
Type I
Unlisted X

Conditioned Negative Declaration:
Yes
No X

Description of Action:

Approval of an interim solid waste management program (the "Interim Program") which provides for certain initiatives during the "Interim Period" as defined in the Ulster County Solid Waste Management Plan (the "Plan"); adoption of a Landfill Consolidation Plan; leasing, operating and closing 3 Consolidation Landfills during the Interim Period; execution of modified consent orders with NYSDEC and the Consolidation Landfill Towns; development of a Landfill Closure Assistance Plan; and development of a financing plan.

Location: (Include street address and the name of the municipality/county. A location map of appropriate scale is also recommended.)

Ulster County

Reasons Supporting This Determination:

The determination that this Unlisted Action will not have a significant effect on the environment results from an analysis of the criteria set forth in 6 NYCRR Section 617.11(a). This action involves the approval of an interim solid waste management program (the "Interim Program") under which the Ulster County Resource Recovery Agency (the "Agency") will provide certain programs and solid waste management services until the permanent components of the Solid Waste Management System provided for under the approved Solid Waste Management Plan are implemented. The Interim Period is 1992 through 1995. Under the Plan, as originally approved, the Agency was to have a more passive role in solid waste management until such time as the permanent system was in place. Under the Interim Program, the Plan will be modified to provide for landfill consolidation and assistance to municipalities to close existing non-complying landfills, which will be closed in an orderly fashion. Closure of landfills is an enforcement action by NYSDEC and beyond the control of the Agency. However, the Agency's active involvement during the Interim Period will ensure a coordinated closure process and the continuous provision of solid waste management services. This will be accomplished principally through the Agency's leasing and operating of 3 Consolidation Landfills, which pursuant to the Agency's review and NYSDEC's input, are the three existing landfills, which do not pose a significant threat to the environment and can be operated under modified consent orders (also a NYSDEC enforcement action) until December 31, 1995, by which time the long-term County-wide disposal facility will be operational or alternative disposal means will be provided. All disposal activities at the Consolidation Landfills will be restricted to the existing footprints. There will be no expansion beyond existing capacity. Operation will be governed by NYSDEC enforcement authority and a NYSDEC monitor will be required. The Agency will close and monitor the three Consolidation Landfills in accordance with current 6 NYCRR Part 360 regulations. Thus, the Action provides for greater protection of the environment and for coordinated solid waste management during the Interim Period. Each component of the Action supports and furthers the long-term goals of the Plan. Therefore, this action will not have an adverse affect on the environment.

(1) The action <u>will not</u> result in any substantial adverse change in existing air quality, ground or surface water quality or quantity, traffic or noise levels. Nor will there be an increase in the potential for soil erosion, flooding, leaching or drainage problems. The Action will improve ground water quality and surface water quality in that the Consolidation Landfills will be operated and closed under stricter 6 NYCRR Part 360 standards and closure of the other existing non-complying solid waste landfills in the County will be coordinated, occur sooner

under the action and will benefit from funds in the LCAP. There will be no substantial increase in solid waste production (in fact a decrease is expected due to recycling) and the increase in truck traffic at the Consolidation Landfills will be minimal, in the range of 5-15 additional trucks trips per day.

(2) The action will not result in the removal or destruction of large quantities of vegetation or fauna; substantial interference with the movement of any resident or migratory fish or wildlife species; impacts on a significant habitat area; substantial adverse impacts on a threatened or endangered species of animal or plant, or the habitat of such a species; or other significant adverse effects to natural resources;

(3) The action will not encourage or attract a large number of people to a place or places for more than a few days, compared to the number of people who would come to such a place absence of the action;

(4) The action will not result in the creation of a material conflict with the community's current plans or goals as officially approved or adopted. Actually, it will help facilitate and expedite the implementation of the goals set forth in the Plan.

(5) The action will not result in the impairment of the character or quality of important historical, archeological, architectural, or aesthetic resources or of existing community or neighborhood character;

(6) The action will not result in a major change in the use of either the quantity or type of energy;

(7) The action will not create a hazard to human health. It will instead protect human health by providing for the coordinated closure of non-complying landfills and the closing of Consolidation Landfills under stricter standards.

(8) There will be no substantial change in the use, or intensity of use, of land including agricultural, open space or recreational resources, or in its capacity to support existing uses. Existing footprints of existing landfills will be used only up to their capacity. The increased amount of waste to be disposed of at the Consolidation Landfills beyond that originally planned will be disposed of in accordance with the stricter operating and closure requirements of 6 NYCRR Part 360.

(9) The Action will not result in the creation of a material demand for other actions which would result in one of the above consequences.

(10) There will not be changes in two or more elements of the environment, no one of which has a significant effect on the environment, but when considered together result in a substantial adverse impact on the environment.

(11) Finally, there are not two or more related actions undertaken, funded or approved by an agency, none of which has or would have a significant effect on the environment, but when considered cumulatively, would meet one or more of the criteria in this section.

The reasonably related long-term short-term accumulative effects of this action are more specifically reviewed in the Environmental Assessment Form attached to this negative declaration, and in the Final Generic Environmental Impact Statement concerning the Ulster County Solid Waste Management plan prepared by the Ulster County Resource Recovery Agency and on file at the address set forth below.

See the Environmental Assessment Form, with Exhibit "1" and Appendices for further information.

For further information:

Contact Person: Charles P. Shaw, Executive Director
Ulster County Resource Recovery Agency

Address: 52 Main Street
U.P.O. Box 4298
Kingston, N.Y. 1240

Telephone: (914) 339 1223

STATE OF NEW YORK)
) ss:
COUNTY OF ULSTER)

I, the undersigned Secretary of the Ulster County Resource Recovery Agency, do hereby certify that I have compared the foregoing Resolution No. 206 of the Ulster County Resource Recovery Agency (the "Agency") adopted at a duly convened meeting of the Agency held on June 18, 1992 with the original thereof on file in my office, and that the same is a true and correct copy of the corrected original and of the whole of the corrected original insofar as the same relates to the subject matters therein referred to.

I FURTHER CERTIFY that (i) all members of the Agency had due notice of the meeting, (ii) the meeting was in all respects duly held, (iii) pursuant to Section 99 of the Public Officers Law (Open Meeting Law), the meeting was open to the general public, and public notice of the time and place of the meeting was duly given to the public and news media in accordance with Section 99, (iv) there was a quorum of the members of the Agency present throughout the meeting and, (v) Resolution No. 206 was approved by a majority of the membership of the Agency.

I FURTHER CERTIFY that, as of the date hereof, the attached resolution is in full force and effect and has not been amended, repealed or rescinded.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Issuer this 18 day of June, 1992.

ULSTER COUNTY RESOURCE RECOVERY AGENCY

Charles P. Shaw
Secretary

ULSTER COUNTY RESOURCE RECOVERY AGENCY

RESOLUTION NO. 207

Re: Adoption of Modifications to Ulster County Solid Waste Management Plan

WHEREAS, the Ulster County Resource Recovery Agency (the "Agency") has entered into a contract with the New York State Department of Environmental Conservation for the development of an integrated solid waste management plan (the "Plan"), Contract No. C809021, and

WHEREAS, it is the Agency's intent to develop a viable solution to its solid waste management needs by preparing the Plan in accordance with the provisions of ECL 27-0107, and

WHEREAS, the Agency finds that the Plan as approved by the New York State Department of Environmental Conservation should be modified to better meet the needs of the County of Ulster,

NOW, THEREFORE, BE IT

RESOLVED, that the Ulster County Resource Recovery Agency adopts the modified integrated solid waste management plan dated June 18, 1992 and entitled "Final Solid Waste Management Plan, Ulster County", as approved by the New York State Department of Environmental Conservation on December 1991 and modified June 1992, and will implement such solid waste management program, projects and plans as identified in the recommendation of said modified plan as the local integrated solid waste management plan in effect for the County of Ulster, and be it

FURTHER RESOLVED, that the Agency hereby intends to ensure that all modifications, upon approval by the New York State Department of Environmental Conservation (DEC), by made to all official copies of the existing DEC approved Plan, and be it

FURTHER RESOLVED, that the Agency hereby intends to provide the DEC with reports every two years displaying compliance with the action items and schedules contained in the modified plan, and be it

FURTHER RESOLVED, that the Agency hereby intends to submit additional modifications to the modified plan to the DEC for approval whenever there is any substantive deviation from the modified plan.

Upon a motion duly made, seconded and approved, this resolution was carried and the chairman declared it adopted.

Vote: Ayes 3 Nays 1

Date: June 18, 1992

CERTIFICATE OF RECORDING OFFICER

I hereby certify that this Resolution is a true and correct copy of a Resolution duly adopted

at a meeting of the Ulster County Resource Recovery Agency duly held on the 18th day of June, 1992; and further

that such Resolution has been fully recorded in the Minute Book in my office.

IN WITNESS WHEREOF, I have hereunto set my hand this 18th day of June, 1992.

Charles C. Shaw
(Signature of Recording Officer)

If the Applicant has an Official Seal, impress here.

Executive Director and Secretary
(Title of Recording Officer)

Ulster County Resource Recovery Agency

52 Main Street, U.P.O. Box 4298
Kingston, New York 12401
(914) 339-1223

1987

July 21, 1992

Mr. Norman Nosenchuck, Director
New York State Dept. of Environmental Conservation
50 Wolf Road
Albany, NY 12233

RE: Ulster County Solid Waste Management Plan and Solid Waste Management Planning Grant - Contract No. C809021, as amended

Dear Mr. Nosenchuck:

Enclosed in accordance with the provisions of 6 NYCRR 360-15.11, please find five (5) sets of:

- **Volume I, Ulster County Solid Waste Management Plan** as approved by NYSDEC, December, 1991 and modified August, 1992;

- **Volume II, "First Modification to the Ulster County Solid Waste Management Plan - Interim Solid Waste Management Program"** (dated August, 1992)

Also please find five (5) certified copies of Resolutions No. 206 and No. 207 adopted by the UCRRA Board of Directors on June 18, 1992. By these resolutions the Board determined that this modification had no significant adverse environmental impacts and issued a negative declaration.

As you know, the Ulster County Final SWMP was approved by NYSDEC on December 3, 1991. Since that time, UCRRA has decided to implement an Interim Solid Waste Management Program for a period of time (1992-1995) while continuing to develop its approved long-term plan. The Interim Program is the subject of this modification and is described in detail in Volume II. Generally under the Interim Program, the Agency would:

- Implement a Landfill Consolidation Plan (LCP) whereby, under Orders on Consent with NYSDEC, the Agency would take over three (3) of the fifteen (15) existing municipal landfills (known as Consolidation Landfills) and operate them for the benefit of the entire County. This would be done during the interim period (1992-1995);

- Implement a Landfill Closure Assistance Program (LCAP) whereby the Agency would pay a portion of the closure costs of the twelve (12) remaining municipal landfills that will be closed by October, 1993;

- Partially fund and develop in cooperation with each municipality Rural Transfer Stations to replace the landfills that will be closed;

- Develop a Financing Plan and issue revenue bonds to pay for the cost of implementing the Interim Program.

The NYSDEC's first official response to the Agency's proposed modification came in a letter dated November 4, 1992 at which time NYSDEC supported the Landfill Consolidation Concept and requested that this modification:

(1) Meet the criteria set forth in NYSDEC Commissioner Jorling's enforcement directive as amended 12/12/88;

(2) Comply with NYSDEC Guidelines for Modifications of NYSDEC approved Solid Waste Management Plans (SWMP) in accordance to 6 NYCRR 360-15.11;

(3) Undergo a public review process including compliance with SEQRA.

Since November 4, 1991, the Agency and NYSDEC representatives have met and discussed the modified interim program on numerous occasions. Informational meetings were held in each municipality and the required public hearings were also held. UCRRA believes that the enclosed submission is fully responsive to NYSDEC's comments.

To help facilitate your staff's review, I have prepared a memo (attached) which explains how this submission meets the requirements outlined in the "NYSDEC Guidance Document for Modification of NYSDEC Approved Solid Waste Management Plans" in accordance to 6 NYCRR 360-15.11 .

UCRRA respectfully requests that this Plan Modification request be approved by NYSDEC pursuant to 6 NYCRR 360-15 at your earliest convenience.

Thank you for your kind attention and consideration of this matter.

Sincerely,

Charles P. Shaw

Charles P. Shaw
Executive Director

COPY: Ralph Manna, Region III (with two sets of end)
UCRRA Board
Stephen J. Wing, Esq., Agency Counsel

LBP
5-4-93

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling
Commissioner

April 28, 1993

Mr. Charles P. Shaw
Executive Director
Ulster County Resource
Recovery Agency
52 Main Street
UPO Box 4298
Kingston, NY 12401

Dear Mr. Shaw:

Re: Ulster County Solid Waste Management Plan
and First Modification

On July 24, 1992, the New York State Department of Environmental Conservation (DEC) received, for review and approval, the Ulster County integrated solid waste management plan entitled: "Ulster County Solid Waste Management Plan and First Modification Interim Solid Waste Management Program," dated August 1992. Said plan modification was adopted on June 18, 1992 by Resolution No. 201 of the Ulster County Resource Recovery Agency.

Ulster County determined that an Environmental Impact Statement was not necessary for the adoption of this modified plan and, in this regard issued a State Environmental Quality Review Negative Declaration in accordance with 6 NYCRR Subdivision 617.10(i).

We have determined that this Ulster County Final Solid Waste Management Plan and First Modification contains a substantive consideration of the elements set forth in Section 27-0107.1 of the New York State Environmental Conservation Law. Accordingly, the said Ulster County Final Solid Waste Management Plan and First Modification is hereby approved this date, April 28, 1993, by this Department with respect to those elements.

The Ulster County Resource Recovery Agency must ensure that all official copies of the previously approved plan are revised to include all modifications hereby approved.

Please note that any additional modifications to this approved local solid waste management plan modification must be submitted to this Department for prior approval, pursuant to 6 NYCRR Section 360-15.11.

In addition, compliance reports must be submitted to this Department pursuant to Resolution No. 207 of the Ulster County Resource Recovery Agency, dated June 18, 1992. In reviewing these compliance reports, we will pay particular attention to Ulster County's efforts to intensify its recycling programs.

The key to effective solid waste management is proper planning. Planning and priorities must be carefully considered to assure limited resources are spent wisely on projects that establish rational, lasting foundations for environmentally-sound solid waste management at the local level.

We are particularly pleased that Ulster County will implement those programs, projects and plans identified in the August 1992 Ulster County Final Solid Waste Management Plan and First Modification.

Please call Penelope Cioffi (518-485-5855), of our Bureau of Facility Management, if you have any questions regarding this matter.

Sincerely,

Phyllis Y. Atwater

Phyllis Y. Atwater
Director
Division of Solid Waste

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling
Commissioner

DEC 0 3 1991

Mr. Charles P. Shaw
Executive Director
Ulster County Resource
Recovery Agency
52 Main Street
U.P.O. Box 4298
Kingston, NY 12401

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 5
To Charles P Shaw	From S Betts
Co. Ulster County	Co. Central Office
Dept.	Phone # (518) 485-8855
Fax # 914-339-1470	Fax # (518) 457-1283

Dear Mr. Shaw:

Re: Ulster County Comprehensive
Solid Waste Management Plan

On October 30, 1991, the New York State Department of Environmental Conservation (DEC) received for review and approval the Ulster County Comprehensive Solid Waste Management Plan entitled: "Ulster County Final Solid Waste Management Plan, An Integrated Decentralized System," dated October 1991. Said plan was adopted on March 18, 1991 by Resolution No. 141 of the Ulster County Resource Recovery Agency.

Ulster County determined that an Environmental Impact Statement was necessary for the adoption of this plan and, in this regard, issued a State Environmental Quality Review Findings Statement in accordance with 6 NYCRR Subdivision 617.10(i). Therefore, having considered the Ulster County Comprehensive Solid Waste Management Plan and having considered the written facts and conclusions relied upon to meet the requirements of 6 NYCRR Part 617 for the Ulster County Comprehensive Solid Waste Management Plan, I have signed/certified the DEC Findings Statement this date, December 3, 1991, to approve/fund/undertake this plan. Enclosed is this original Findings Statement.

We have determined, therefore, that this Ulster County Comprehensive Solid Waste Management Plan contains a substantive consideration of the elements set forth in Section 27-0107.1 of the New York State Environmental Conservation Law. Accordingly, the said Ulster County Comprehensive Solid Waste Management Plan is hereby approved by this Department with respect to those elements.

Please note that any modifications to this approved local solid waste management plan must be submitted to this Department for prior approval, pursuant to 6 NYCRR Section 360-15.11.

The key to effective solid waste management is proper planning. Toward that end, we are glad that Ulster County adopted the October 1991, Ulster County Final Solid Waste Management Plan as the local integrated solid waste management plan for Ulster County.

We are pleased that Ulster County will implement those programs, projects, and plans identified in this planning document as its integrated solid waste management plan.

Request for final payment under the comprehensive solid waste management planning grant program, State Contract No. C809021, may now be submitted.

If you have any questions on this matter, please contact Penelope Cioffi, of my staff, at 518-485-5855.

Sincerely,

Norman H. Nosenchuck, P.E.
Director
Division of Solid Waste

Enclosure

617.21
Appendix 1
State Environmental Quality Review
(SEQR)

FINDINGS STATEMENT

Pursuant to Article 8 (State Environmental Quality Review Act-SEQR) of the Environmental Law and 6 NYCRR Part 617, the New York State Department of Environmental Conservation, as lead or involved agency, makes the following findings.

Name of Action:

Ulster County Integrated Solid Waste Management Plan

Description of Action:

Approval of Ulster County's Integrated Solid Waste Management Plan

Location:

County-wide; all municipalities in Ulster County

Agency Jurisdiction(s):

New York State Department of Environmental Conservation (Department) [Section 27-0107 of the New York State Environmental Conservation Law (ECL)].

Date Final EIS Filed:

June 27, 1990 by Ulster County Resource Recovery Agency

Facts and Conclusions in the EIS Relied Upon to Support the Decision:

Ulster County submitted their draft solid waste management plan and environmental impact statement (EIS) for review on October 31, 1990 under State grant contract number C809021. The Department reviewed this draft plan for compliance with Section 27-0107 of the NYS Environmental Conservation Law (ECL) and in accordance with 6 NYCRR Part 360-15. On December 27, 1990, the Department provided comments to Ulster County. Ulster County responded to these Department concerns by submitting a revised solid waste management plan (responsiveness summary) on July 18, 1991. The Department provided further comments on August 22, 1991. The Final Ulster County Solid Waste Management Plan/Final Generic Environmental Impact Statement was then submitted on October 30, 1991. The Department's Division of Solid Waste has completed its review of the Ulster County integrated solid waste management plan (the plan) and has determined that it (the plan)

(Continued on Attachment No. 1)

Attachment No. 1

617.21
Appendix 1
State Environmental Quality Review
(SEQR)

FINDINGS STATEMENT

Name of Action:

Ulster County Integrated Solid Waste Management Plan

Facts and Conclusions in the EIS Relied Upon to Support the Decision:
(Continued)

complies with Section 27-0107 of the ECL. Under this plan, Ulster County intends to sponsor a multi-faceted source separation and materials recycling program, including construction of a Satellite Aggregation Center to process recyclable materials; a yard waste composting program; and to achieve a 52% waste reduction, reuse and recycling rate by 1997. Ulster County will also pursue siting a new municipal solid waste landfill to handle waste that will not be reduced, reused or recycled.

Identification Number: C809021

Name of Action: Ulster County Integrated Solid Waste Management Plan

CERTIFICATION OF FINDINGS TO APPROVE/FUND/UNDERTAKE

Having considered the Draft and Final EIS, and having considered the preceding written facts and conclusions relied upon to meet the requirements of 6 NYCRR 617.9, this Statement of Findings certifies that:

1. The requirements of 6 NYCRR Part 617 have been met;

2. Consistent with the social, economic and other essential considerations from among the reasonable alternatives thereto, the action approved is one which minimizes or avoids adverse environmental effects to the maximum extent practicable; including the effects disclosed in the environmental impact statement, and

3. Consistent with social, economic and other essential considerations, to the maximum extent practicable, adverse environmental effects revealed in the environmental impact statement process will be minimized or avoided by incorporating as conditions to the decision those mitigative measures which were identified as practicable.

New York State Department of Environmental Conservation
Name of Agency

Signature of Responsible Official

Norman H. Nosenchuck
Name of Responsible Official

Director, Division of Solid Waste
Title of Responsible Official

DEC 0 3 1991
Date

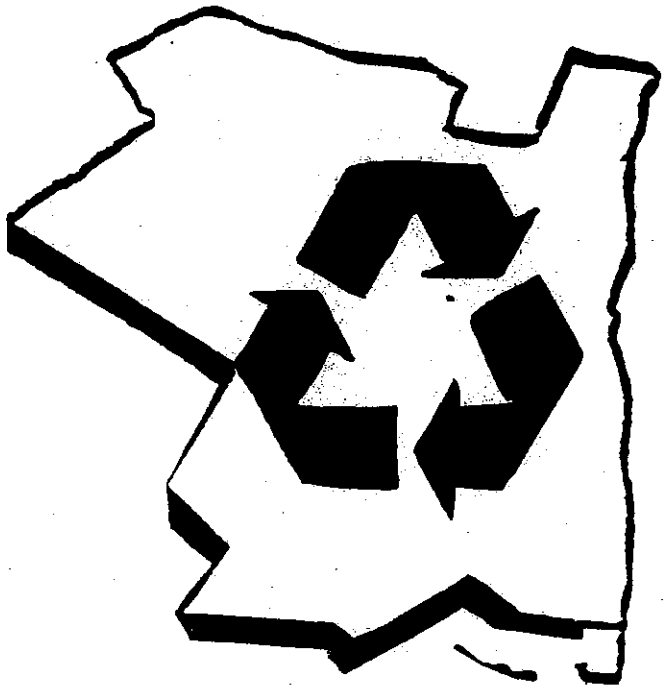
50 Wolf Road, Albany, New York 12233-4010
Address of Agency

VOLUME I

ULSTER COUNTY

FINAL

SOLID WASTE MANAGEMENT PLAN



AN

INTEGRATED DECENTRALIZED SYSTEM

Prepared - October, 1991
NYSDEC Approved - December, 1991
Modified - August, 1992
(Changes Incorporated Herein and in Volume II)

ULSTER COUNTY RESOURCE RECOVERY AGENCY
SEAL OF ULSTER COUNTY STATE OF NEW YORK
1987

PRINTED ON RECYCLED PAPER

I. TITLE PAGE

- **Plan Title:** Ulster County Solid Waste Management Plan and Comprehensive Recycling Analysis

- **Location of Planning Unit:** Ulster County, New York
  P.O. Box 4298
  52 Main Street
  Kingston, New York 12401

Date: March 1991

ACKNOWLEDGEMENTS

- **UCRRA Board Members:**

  Elizabeth Jordan - Chairman
  Ben Matteson - Vice-Chairman
  John Wadlin, Esq. - Treasurer
  Eleanor Minsky, Esq. - At-Large
  Stephen Heyer, Sr. - At-Large

- **UCRRA Staff/Counsel:**

  Charles P. Shaw - Executive Director
  Mary M. O'Connell - Business/Office Manager
  Manna Jo Greene - Recycling Coordinator/Educator
  Orvil Norman - Compost Coordinator
  Amy Kletter - Recycling Research Assistant
  Laura B. Petit - Executive Secretary
  David Bailinson - Administrative Assistant
  Stephen J. Wing, Esq. - Legal Counsel
  Rachel Molinaro, Esq. - Assistant Legal Counsel

- **Special Thanks to:**

  Members of the Citizen's Advisory Committee
  Members of the Municipal Recycling Coordinator's Roundtable
  Ulster County Legislature
  Ulster County Municipalities
  General Public

- **Prepared in part with the assistance of NYS Department of Environmental Conservation (NYSDEC) Solid Waste Management Planning Grant.**

- **Date of Acceptance by the Agency:** March 18, 1991

II. TABLE OF CONTENTS

TABLE OF CONTENT (con't)

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

12.0 REFERENCES

LIST OF TABLES

LIST OF TABLES (con't)

LIST OF FIGURES

LIST OF FIGURES (con't)

LIST OF FIGURES (con't)

10.0 GENERIC ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

11.0 PUBLIC PARTICIPATION - SEQRA COMPLIANCE

12.0 REFERENCES

EXECUTIVE SUMMARY

ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN

EXECUTIVE SUMMARY

The development of a solid waste management plan ("The Plan") for Ulster County (the "County") is authorized by the New York State Solid Waste Management Act of 1988. It is subject to the New York State Environmental Quality Review Act ("SEQRA") process and solid waste planning regulations set forth in 6 NYCRR Part 360-15 administered by the New York State Department of Environmental Conservation ("NYSDEC"). SEQRA suggests a Generic Environmental Impact Statement ("GEIS") as a means for agencies to review the conceptual framework of a proposed plan, thus giving early consideration to environmental factors, as well as social and economic issues.

The Ulster County Resource Recovery Agency ("UCRRA") was authorized by the County Legislature to develop "The Plan" and conduct the SEQRA review. UCRRA conducted a SEQRA review of the Plan which resulted in the approval of a Final GEIS and the issuance of a Findings Statement in September of 1990. The SEQRA process addressed the environmental, social, and economic impacts of "The Plan", identified potential areas for siting facilities, and recommended technologies for solid waste management facilities.

Implementation of "The Plan" will require the preparation of a specific Environmental Impact Statement to address site and technology specific environmental impacts and support permit applications to NYSDEC.

After completion of the SEQRA process, "The Plan" was presented to and approved by UCRRA and the County Legislature in May of 1991. It has been presented to NYSDEC for approval.

GOALS

The overall goal of the Solid Waste Management Plan is to provide an environmentally sound and cost effective solution to the problems associated with the collection, transportation, processing, and disposal of municipal solid wastes generated in the County. "The Plan" covers a 25 year planning period from 1989-2014. A 5-year interim period from 1989-1994 is necessary for the planning, design, siting, and construction of the various solid waste management facilities called for. These

facilities are expected to be fully operational during their 20-year life, 1994-2014. Some may be functional beyond this time frame.

(**Modification Added 8/92) **During the interim period, UCRRA will implement reduction reuse, and recycling programs, including interim Satellite Aggregation Centers, obtain legal authority from the County Legislature to manage the Solid Waste stream, develop and implement a Landfill Consolidation Plan and Landfill Closure Assistance Program, and issue its first series of revenue bonds.**

COMPONENT ACTIONS

After an extensive evaluation of the alternatives and a determination to meet the goals and objectives of the waste management planning efforts, the County has developed a comprehensive Solid Waste Management Plan based on an integrated system of component actions and a decentralized system of solid waste management facilities (i.e., Recycling Centers, Compost Facility, Transfer Stations, Landfill, etc.).

In keeping with State policy on Solid Waste Management, the County "Plan" embraces the major elements of the solid waste management planning hierarchy and appropri- ately designates waste reduction and recycling (including composting) as the cornerstone of "The Plan". The major program components of the Ulster County "Plan" are as follows:

- **Waste Reduction/Reuse through legislation and education**
- **Household Hazardous Waste - separation, collection, and reuse or disposal programs**
- **Recycling - Satellite Aggregation Center System (SAC) - for major materials recycling identified in the Intermunicipal Agreements (IMAs) with Ulster County municipalities**
- **Recycling - miscellaneous materials recycling program for materials not identified in the IMAs (ie. textiles, batteries, tires, appliances, etc.)**
- **Recycling - Legislative Educational and Institutional programs**
- **Facilitate a construction and demolition debris recycling and volume reduction program**
- **Municipal Organic Waste Composting and Diversion programs to include:**
  - **Municipal Yard Waste Composting program**
  - **Sewage Sludge Management program**
  - **Food Waste Diversion program**

- **Apple/Grape Pomace Reuse/Composting program**
- **Offal Reuse and Diversion program**

- **Municipal Solid Waste (MSW) processing assessment**

- **Facilitate a medical waste management program**

- **Landfilling/Transfer Station System for disposal of residuals (after recycling and organic waste composting) and by pass wastes in a single, new capacity, state-of-the-art landfill**

OVERVIEW OF THE PLAN

New York State solid waste management policy identifies a planning hierarchy of:

- **waste reduction**
- **reuse and recycling**
- **waste-to-energy**
- **land disposal.**

"The Plan" incorporates a solid waste reduction and reuse strategy, a comprehensive recycling/composting program, and a state-of-the-art landfill. This combination provides an integrated approach that follows the hierarchy and effectively addresses environmental, technical, and economic considerations. The major components of "The Plan" as described below.

<u>Waste Reduction</u>

The State has set a solid waste reduction goal of 8% to 10% by 1997. "The Plan" provides for a strong public education program focusing on education for the homeowner and consumer related to the purchase of durable and reusable items; business and manufacturing education on reducing the use of virgin materials, and encouraging the purchase of used equipment whenever possible. UCRRA also supports regional, State and Federal waste reduction initiatives. UCRRA and the County Legislature, through representative groups such as the New York State Association of Counties, and the National Association of Counties, support waste reduction legislation at those governmental levels, and are also considering regional packaging legislation.

Household Hazardous Waste (HHW) Removal Program

Ulster County currently generates about 0.5 tons per day of what are commonly called household hazardous wastes (HHW); also known as household toxics. While representing a negligible percentage of the total waste stream (less than 0.1%) in terms of volume, their potential toxicity may pose a significant threat to the environment, and to public health and safety. Currently there is no comprehensive, Countywide program for segregation, collection, and disposal of HHW.

UCRRA has accepted the responsibility for managing household hazardous waste (HHW) and will implement a HHW collection program that would be coordinated with Ulster County municipalities. The development program should be a cooperative venture between UCRRA and the EMC and should be phased in over time.

Recycling Programs

Recycling, the reuse or processing of materials, reduces the volume of solid waste to be disposed. The County's recycling programs aim to maximize reuse and recycling initiatives through the phased implementation of a Countywide recycling and composting program. The recycling program is being implemented in stages. The phases of the recycling program include the following:

Phase 1 - Technical Assistance to Municipalities (ongoing);

Phase 2 - Recycling Development Projects (completed in 1990);

Phase 3 - Satellite Aggregation Center (SAC) System, Intermunicipal Agreements (IMAs), Municipal Drop-Off Site (MRDS), transportation, marketing and interim systems completed, adoption of County-wide source separation law and permitting and construction of permanent facilities under consideration); and

Phase 4 - Long-term - expand SAC System (evaluation of System, expansion of recyclable materials and markets maximization of education).

Recycling development projects were initiated in 1988 to provide an opportunity for all of the County to recycle newspaper. In addition, a development project in the

Town of Ulster recycled commingled glass and metal containers, as well as newsprint.

An expansion phase of the recycling programs, including composting of leaf and yard wastes, commenced in 1989. This phase involved the establishment of major materials recycling programs in nearly all of the municipalities of the County. This has led to the continuing development of a Satellite Aggregation Center ("SAC") System under which UCRRA will provide collecting equipment, transportation, processing and marketing services for residential and commercial recyclables. Under the SAC System, municipalities are responsible for collecting or overseeing the collection of recyclable materials, and for building and operating Municipal Recycling Drop-Off Sites ("MRDS") under an Intermunicipal Agreement ("IMA") with the Agency.

The recycling program also includes the adoption of a Countywide mandatory source separation law, expansion of recycling to the commercial and institutional sector, development of a miscellaneous materials recycling program, a construction and demolition recycling program, and a household hazardous waste collection program.

Construction and Demolition (C&D) Debris Recycling and Volume Reduction Program

Construction and demolition (C&D) debris refers to wood waste and rubble generated during construction, demolition, refurbishing, and renovation activities. For the most part, C&D debris generated in the County is collected separately by private carters. One minor exception is the small amounts generated by homeowners through home improvement projects may be collected together with household refuse.

The County's goal is to achieve 40% recycling of C&D wastes by 1997. UCRRA recommends that collecting, processing, and disposing (except for wood wastes handled by the Agency's Tub Grinder) of C&D materials be handled by the private sector with UCRRA having overall management responsibilities.

A determination to construct and operate its own facility would be made after the private sector has been given the opportunity to construct and operate C&D recycling facilities. This will occur in mid-1992, after the C&D waste tracking system is in place and providing the necessary data to assess the County's ever changing needs. One private C&D recycling facility has recently

been permitted and is operating within the County. An evaluation of its success in mid-1992 will also be included in the criteria to make this determination.

Municipal Organic Waste Composting and Diversion Program

"The Plan" includes the development of an organic waste composting and diversion program. The program's goal is to divert, capture, and reuse for compost 95%-100% of the approximately 86,064 tons of organic waste generated in the County by 1997. The program will be phased in and integrated with the recycling and waste reduction program.

- **Municipal Yard Waste Composting:** The program begins with municipal yard waste composting. This element has already been implemented by UCRRA in cooperation with all of the County's municipalities. A tub grinder has been purchased and is currently operating at various municipal sites throughout the County, processing brush, clean wood waste and yard waste. Pursuant to agreements with the municipalities, yard waste will be processed by UCRRA and composted by the municipalities at municipal sites. UCRRA will provide technical assistance to ensure that composting is done properly and effectively. Composting operations will be monitored and a quality control program will be implemented.

- **A Food Waste Diversion Program:** This program will be implemented by establishing a pilot research and development project utilizing assistance from such entities as Cornell Cooperative Extension of Ulster County. Additionally, since a significant amount of apple/grape pomace and offal is produced in the County a reuse/composting program will be developed by conducting a pilot research and development project which will identify the appropriate technical program for these materials.

- **Sewage Sludge Management Program:** Approximately 40 to 50 tons per day of sewage sludge are generated within the County. UCRRA will continue to participate with the Ulster County government in regional sludge management initiatives. UCRRA will also pursue, in cooperation with the Ulster County Health Department, monitoring and testing of sewage sludge and will initiate a study to determine the appropriate treatment methods for this solid waste.

Municipal Organic Waste Composting Facility

UCRRA has found that the development of a municipal organic waste co-composting facility will reduce the amount of solid waste to be landfilled, and, therefore development of such a facility would preserve valuable landfill space. UCRRA will encourage the private sector to develop compatible municipal organic waste co-composting facilities. UCRRA will solicit expressions of interest from private sector vendors; review all private sector proposals to develop such facilities within the County; support all compatible development initiatives, and continue to evaluate the development of those facilities within the County. If UCRRA finds that private sector initiatives have not been sufficiently developed, then it will plan, construct, permit and operate or provide for the operation of a municipally owned organic waste co-composting facility for organic waste material that is not being reused, recycled, or otherwise diverted to a higher more beneficial use.

Municipal Solid Waste (MSW) Processing Assessment

A number of European technologies have recently been marketed in this Country which claim to transform mixed municipal solid waste into useable compost product and/or refuse derived fuel (RDF). These technologies are new and several types of facilities are operating on a pilot or demonstrative basis in the United States. The UCRRA maintains that MSW processing is an emerging technology with great promise, and will, more than likely, play a significant role in future solid waste management. However, until such time as the efficiency of the processing systems and, more importantly, the marketability of the compost or RDF end product have been clearly established and proven, the County cannot justify, at this time, committing substantial financial resources toward the development of such a facility at the initial stages of the Solid Waste Management Plan implementation. UCRRA will monitor processing and composting facilities and review emerging technologies for integration with "The Plan" at a future phase.

Single New Landfill

After evaluating available solid waste management technologies, UCRRA has determined to design, permit and construct a single, new capacity landfill as the primary means of disposing of wastes which cannot be reduced,

reused, recycled, or composted. UCRRA estimates that approximately 50% of the County's waste stream over the 20 year planning period will be landfilled. UCRRA's selection of landfill technology involved an extensive analysis of other technology options including waste-to-energy. UCRRA found that because of economic and environmental concerns associated with waste-to-energy, including concerns over the importation of solid waste from outside the County, landfilling was the acceptable technology. UCRRA further determined that a sufficient size to handle the waste generated within the County for the 20 year planning period requires a site of approximately 100 acres. UCRRA also found that the landfill should be sited on glacio-lacustrine clay soils.

UCRRA will develop the landfill in small, manageable cells, ranging in size from 5 to 10 acres. It was determined that the landfill facility should be developed by the public sector to ensure maximum control of disposal of materials at the landfill. "The Plan" also calls for passage of waste stream control legislation to ensure that solid waste generated within the County is properly disposed of at the landfill facility.

"The Plan" also calls for the development of transfer stations throughout the County to ensure that economical transportation of solid waste to the County-wide facility is obtained.

Landfill Siting

UCRRA conducted a siting analyses and has determined that 23 potential candidate areas for landfill development exist within the County. "The Plan" calls for additional studies to be undertaken before a preferred site is selected. The additional studies will focus on soil stability, hydrogeology of soils and archeological sensitivity of candidate areas.

The basic solid waste management strategies, outlined above, will successfully manage the approximately 665 average tons per day of solid waste currently generated in 1988, and the 829 average tons per day expected to be generated by the end of the planning period (2014). Figures ES-1 through ES-4 shows the waste flow components of the "Plan" for the following years:

- **1990 Figure ES-1** - Beginning of the Interim Planning Period;

- **1994 Figure ES-2** - End of the Interim Planning Period;

- **1997 Figure ES-3** - The Year New York State has set to achieve its Recycling Goals;

- **2014 Figure ES-4** - The Last Year in the Planning Period.

These diagrams illustrate the approximate tonnage of solid waste to be allotted towards the various plan components. Each allocation effectively reduces the total waste stream. For example, in the year 1997 after maximum allocation towards waste reduction, recycling, and composting, approximately 50-60% of the County's waste stream will remain. These remaining mixed wastes will be landfilled until such time as other programs are in place and higher percentages of recycling can be achieved.

PLAN IMPLEMENTATION

Figure ES-5 shows the proposed schedule for implementing major components of "The Plan". As indicated, certain elements of the recycling program have already been initiated, in a manner consistent with the County's desire to maximize recycling.

INTRODUCTION/COMPLIANCE WITH STATE SOLID WASTE MANAGEMENT ACT OF 1988 AND STATE SOLID WASTE MANAGEMENT PLAN

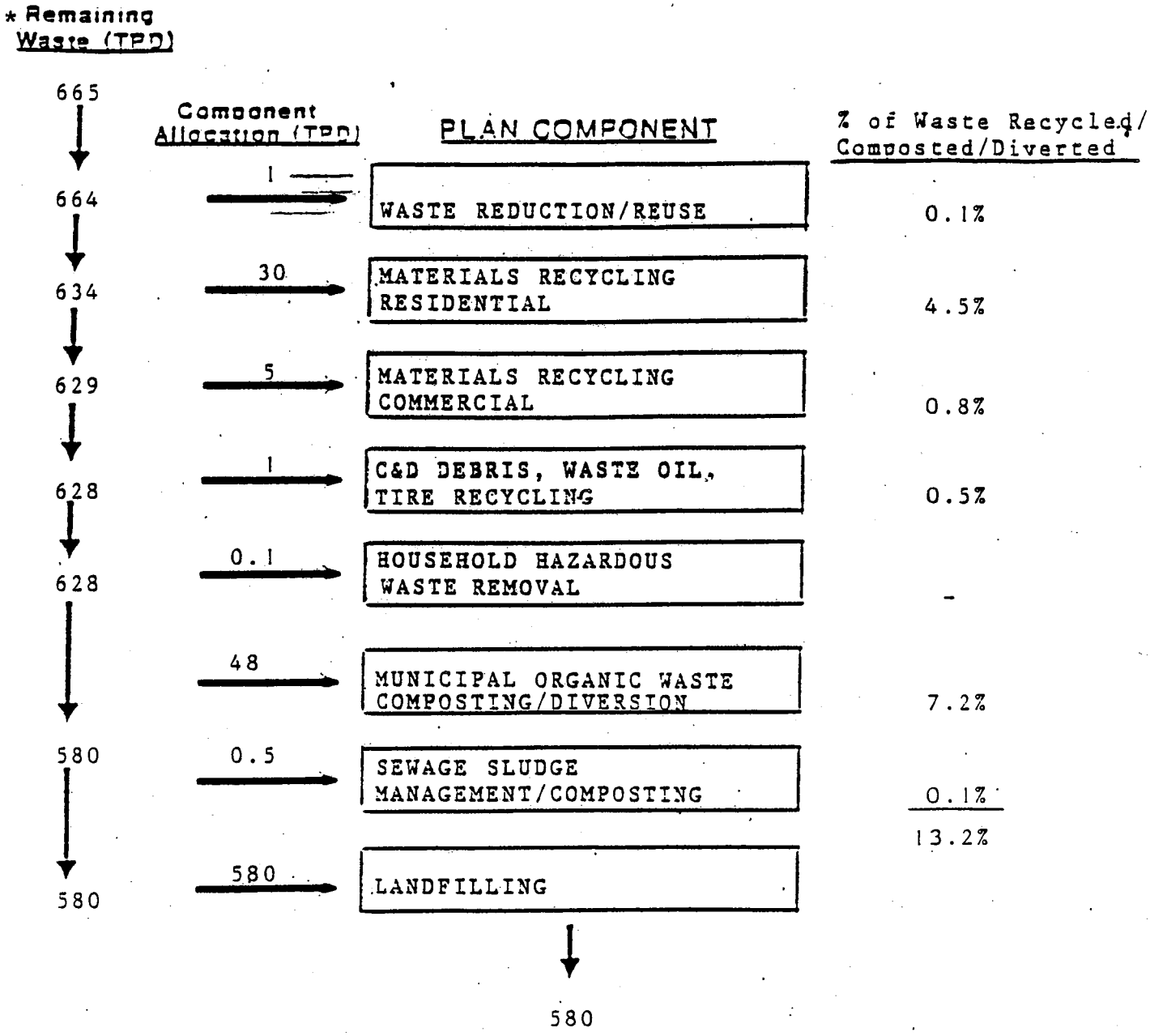
Municipalities within Ulster County requested the County Legislature to address their solid waste management needs. As a result the UCRRA was formed in 1987 to develop a long-term comprehensive solid waste management plan ("The Plan"). "The Plan" addresses the New York State policy for solid waste, and provides for County support of waste reduction measures instituted by the State and Federal governments. In addition, UCRRA has initiated an analysis and consideration of waste reduction measures at the County level (i.e., proposed plastics packaging legislation).

In conjunction with waste reduction measures, the development and implementation of aggressive recycling programs are targeted to maximize recycling and exceed State goals for reduction or recycling of the waste stream by 1997.

FIGURE ES-1

ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN
WASTE FLOW/PLAN COMPONENT DIAGRAM

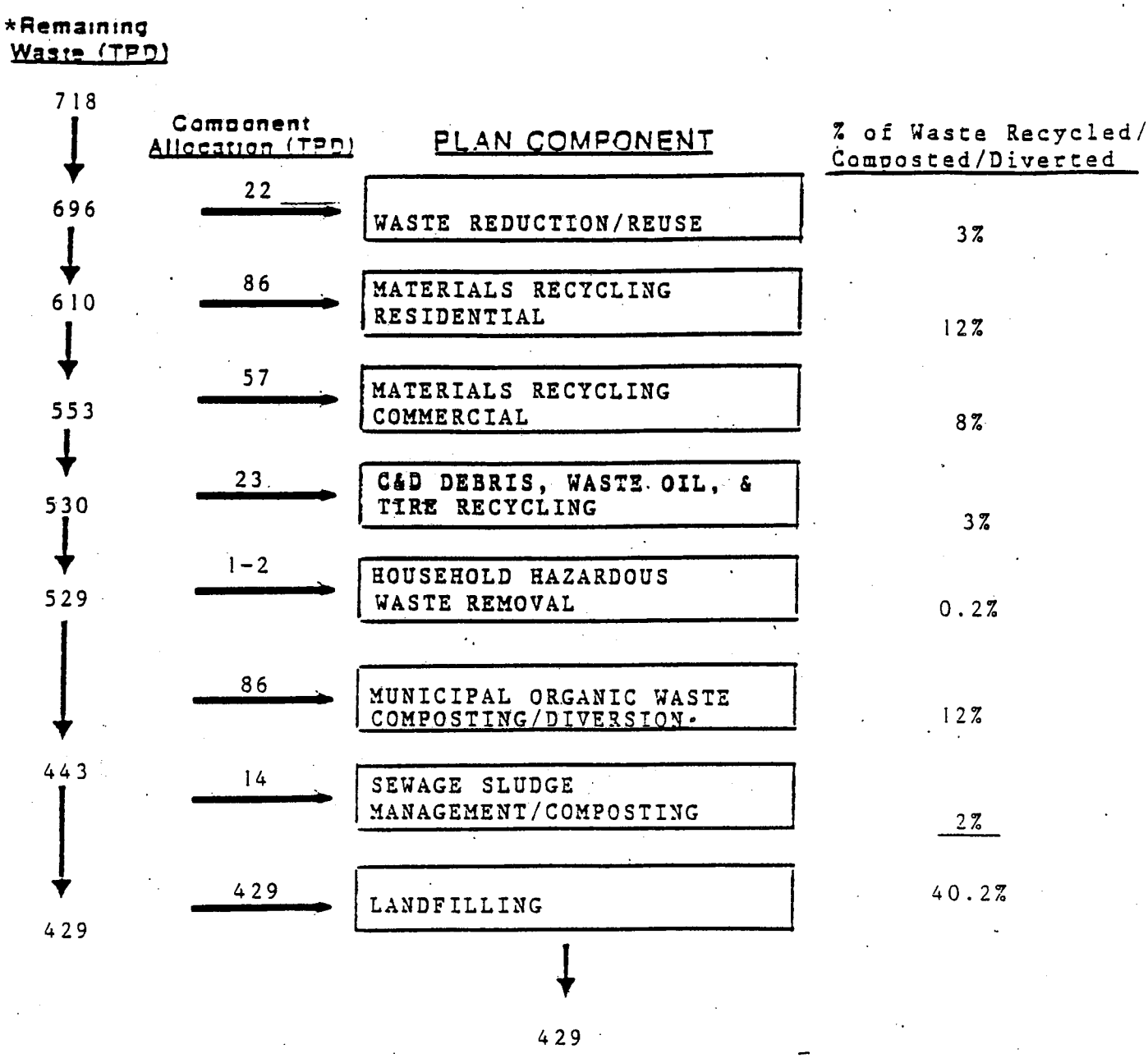
YEAR - 1990



* Remaining Waste TPD After Returnable Bottle Law Reduction

FIGURE ES-2

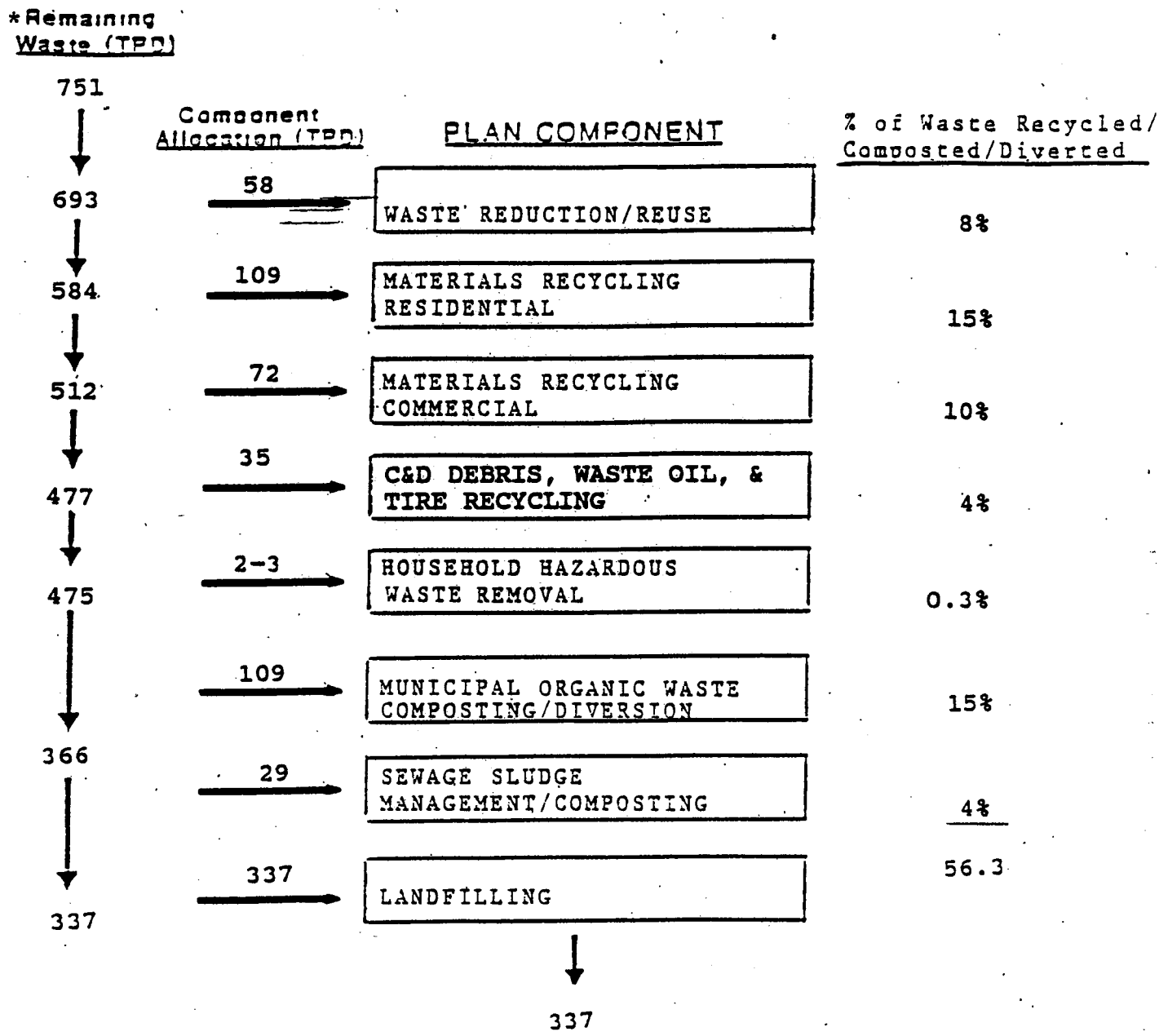
ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN
WASTE FLOW/PLAN COMPONENT DIAGRAM
YEAR - 1994



* Remaining Waste TPD After Returnable Bottle Law Reduction

FIGURE ES-3

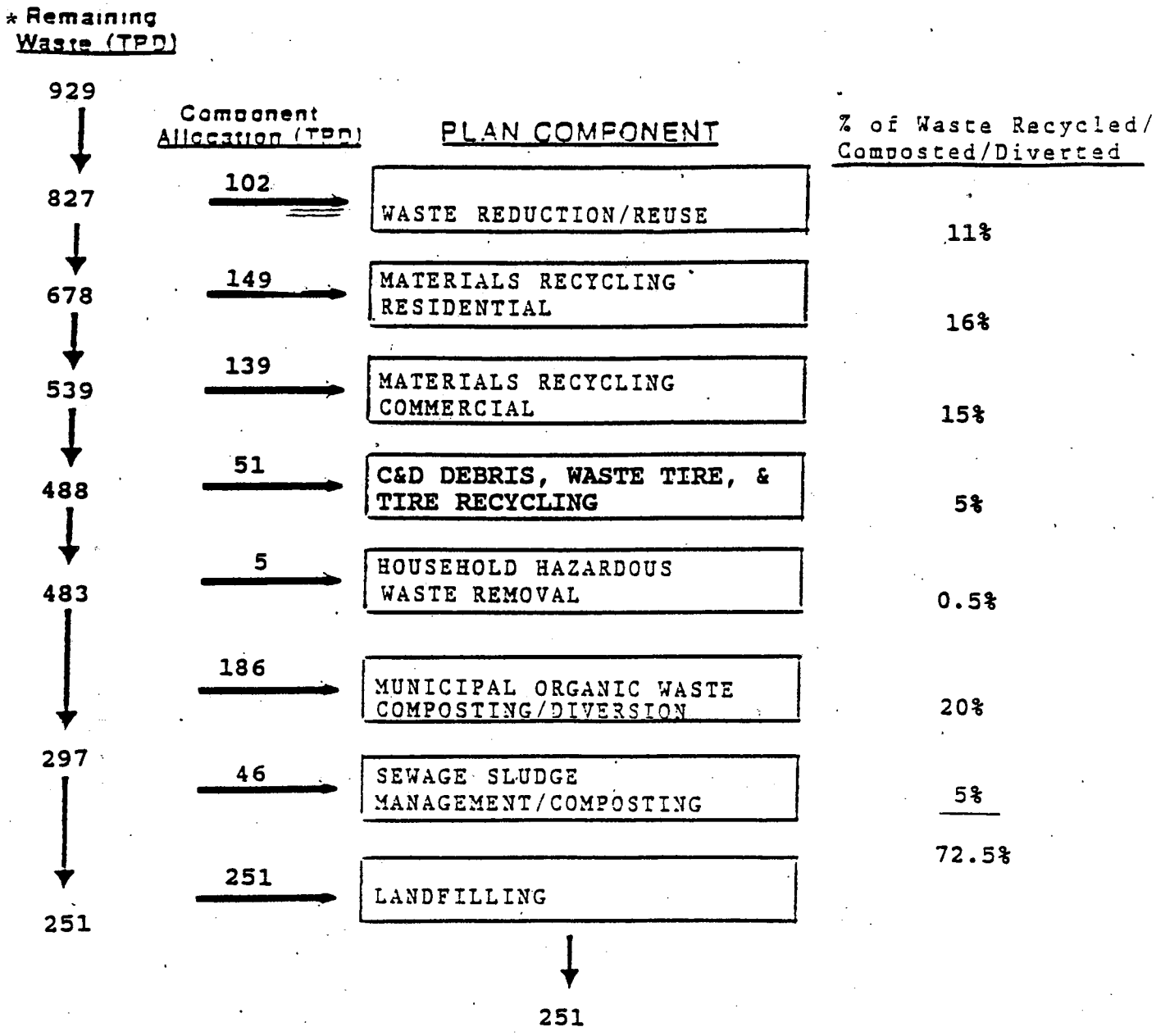
ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN
WASTE FLOW/PLAN COMPONENT DIAGRAM
YEAR - 1997



* Remaining Waste TPD After Returnable Bottle Law Reduction

FIGURE ES-4

ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN
WASTE FLOW/PLAN COMPONENT DIAGRAM
YEAR - 2014



* Remaining Waste TPD After Returnable Bottle Law Reduction

DESCRIPTION OF THE PROPOSED ACTION

The County is located in lower New York State, approximately 90 miles north of New York City and 50 miles South of Albany, and covers approximately 1,140 square miles. In 1988, Ulster County population was approximately 166,000 and it is expected to increase to about 184,000 by 2010. The County's 24 municipalities are composed of three villages, one city, and 20 towns. Fifteen municipal landfills are currently being used for the disposal of most of the solid waste generated in the County.

In 1988, the County generated approximately 235,500 tons of solid waste. By the year 2010, this total is expected to increase to over 300,000 tons. Since the UCRRA was formed in 1987, one major municipal landfill in the County has been closed and others are reaching capacity. Population growth, landfill closures, and more stringent environmental regulations have created the need to reevaluate waste disposal methods and develop new strategies of solid waste management, such as the proposed action discussed in this Plan.

ALTERNATIVES TO THE PROPOSED ACTION

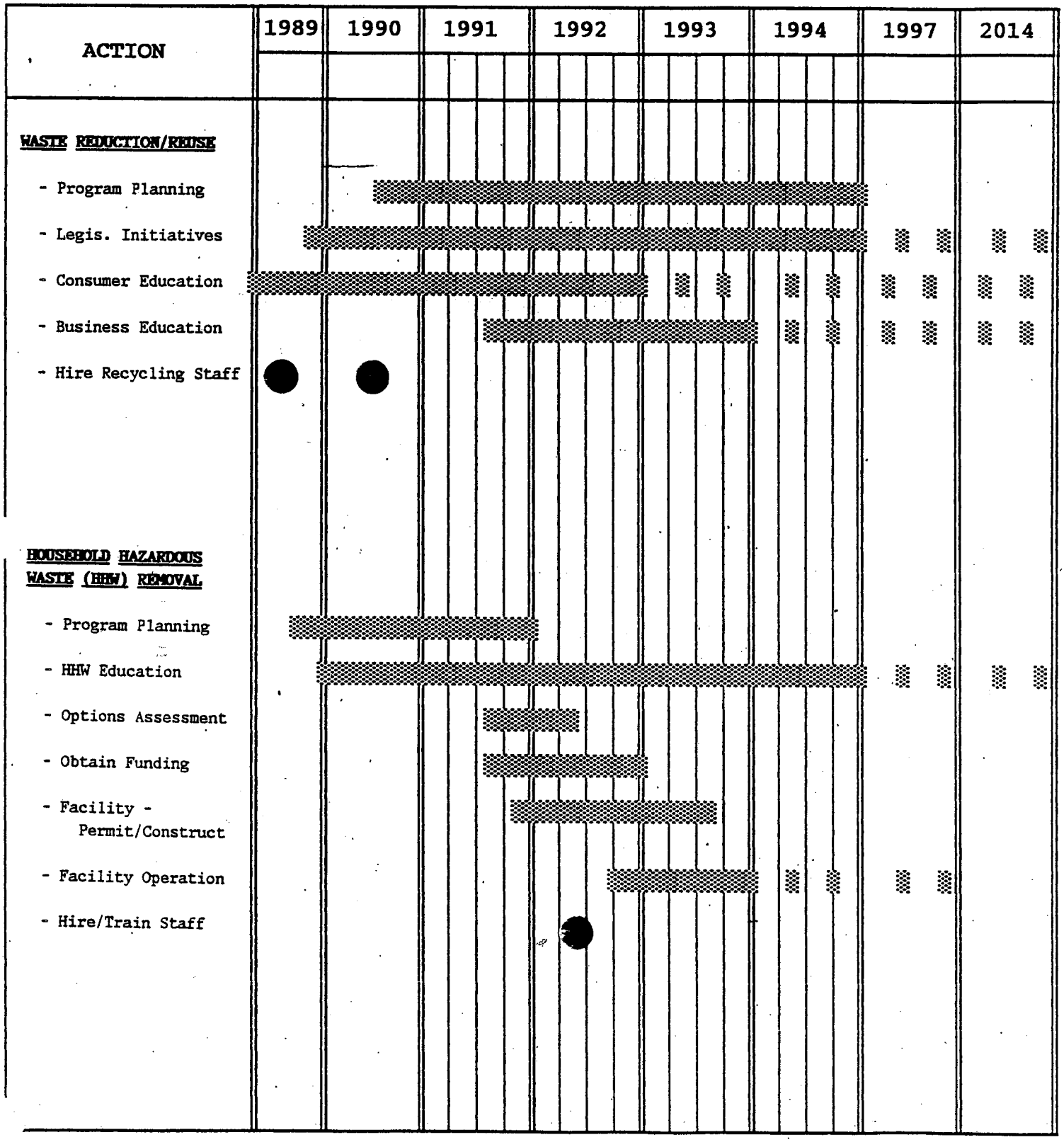
UCRRA has considered reasonable alternatives to the actions described in "The Plan". The alternatives achieve the same or similar objectives, have relatively the same or reduced adverse environmental effects, and can be implemented in a time frame similar to that of the proposed action. The following four alternatives to "The Plan" have been considered:

- No Action Alternative - Local municipalities would continue to be responsible for their solid waste and landfilling at the existing municipal landfills would probably continue, at least initially, as the primary means of waste disposal.

- Immediate Implementation Alternative - The County would forego program planning and move directly to the acquisition of a site(s), selection of technology(ies), procurement of vendor services, and construction of solid waste management facilities.

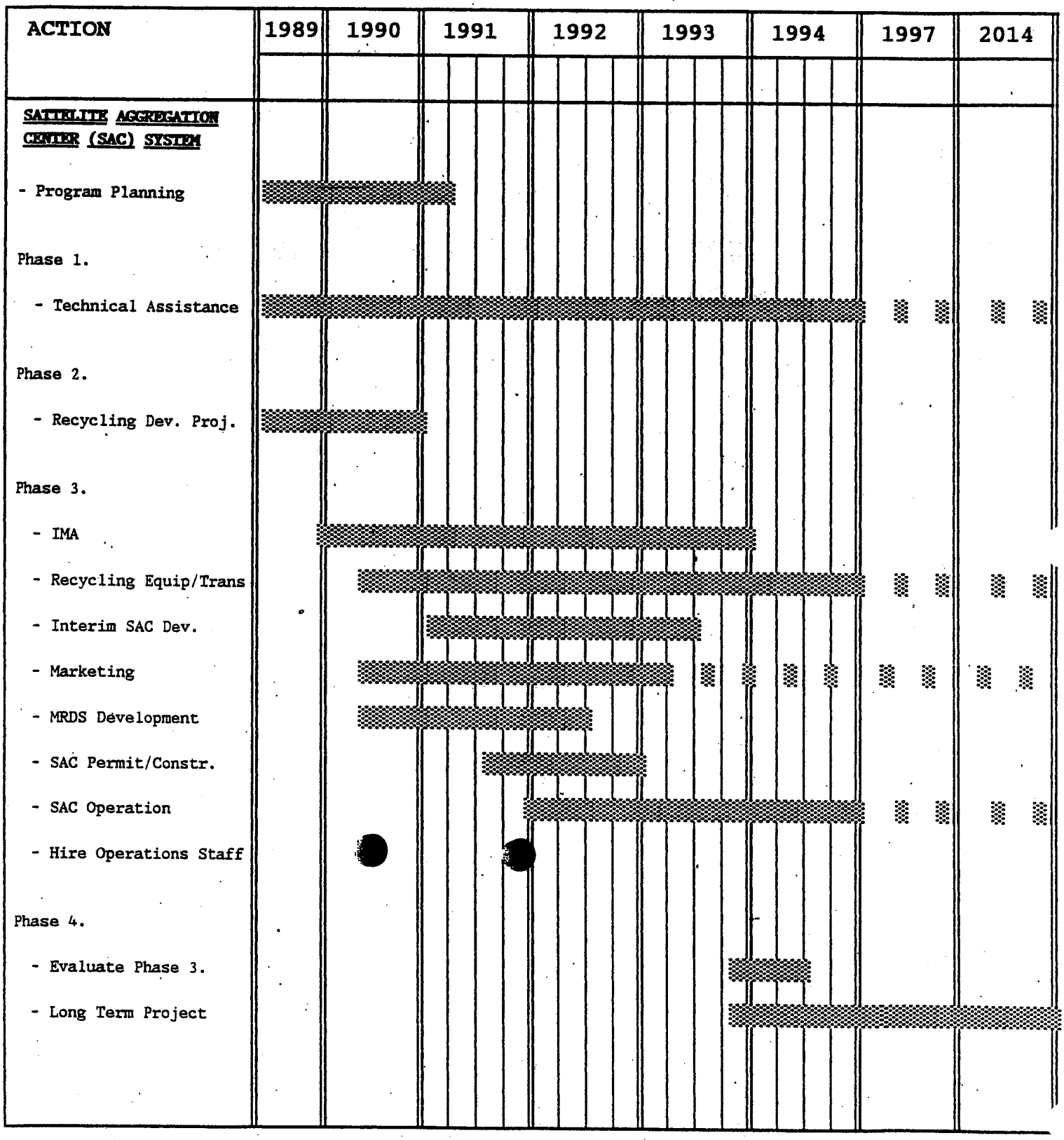
- Reliance on the Private Sector - The County would enter into an agreement with a private company for disposal or processing of solid waste either in another county or state, or within Ulster County.

Figure ES-5
ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN
IMPLEMENTATION SCHEDULE



▒ ▒ ▒ Action on going

Figure ES-5 (Cont'd)



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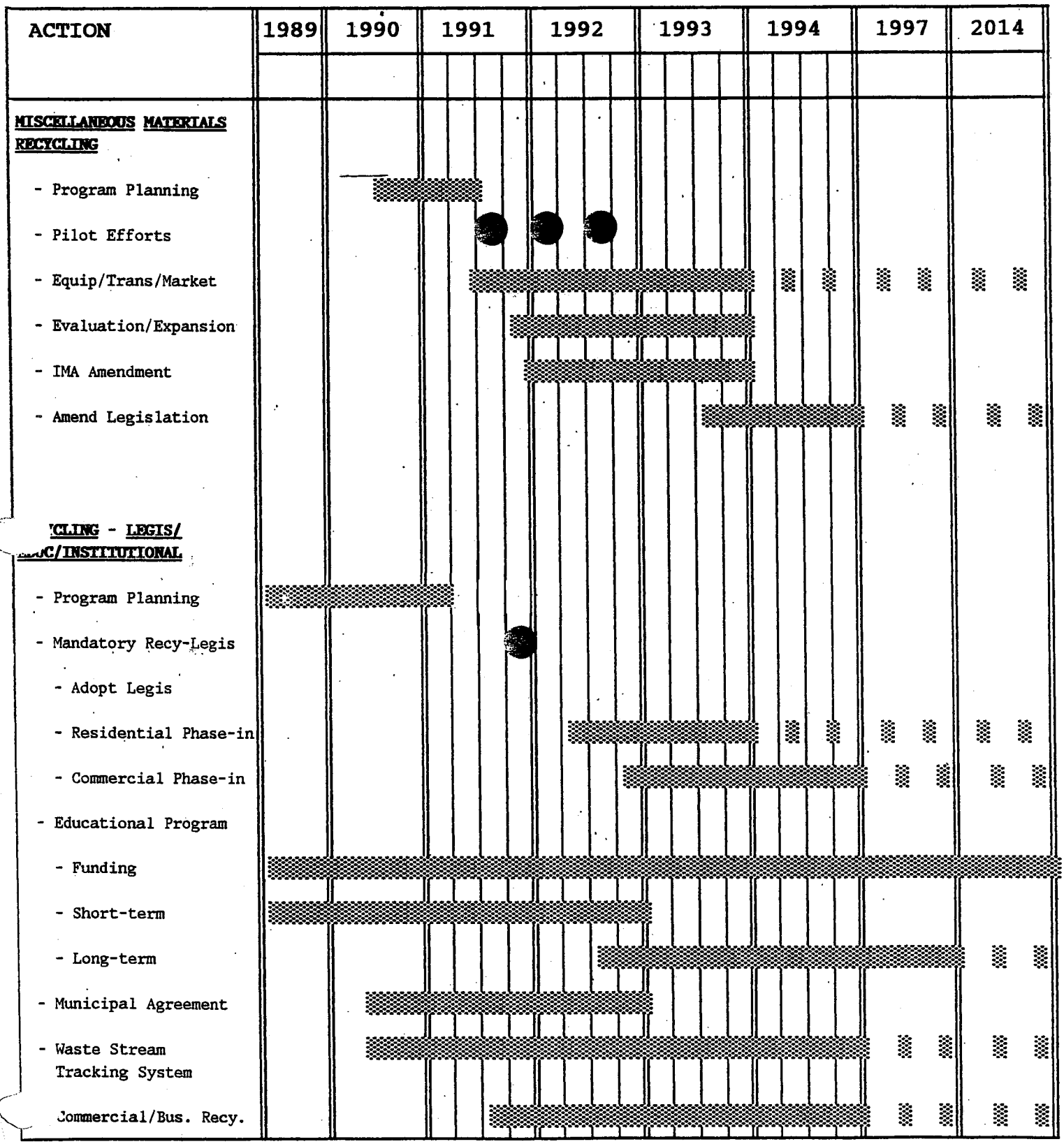

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Figure ES-5 (Cont'd)

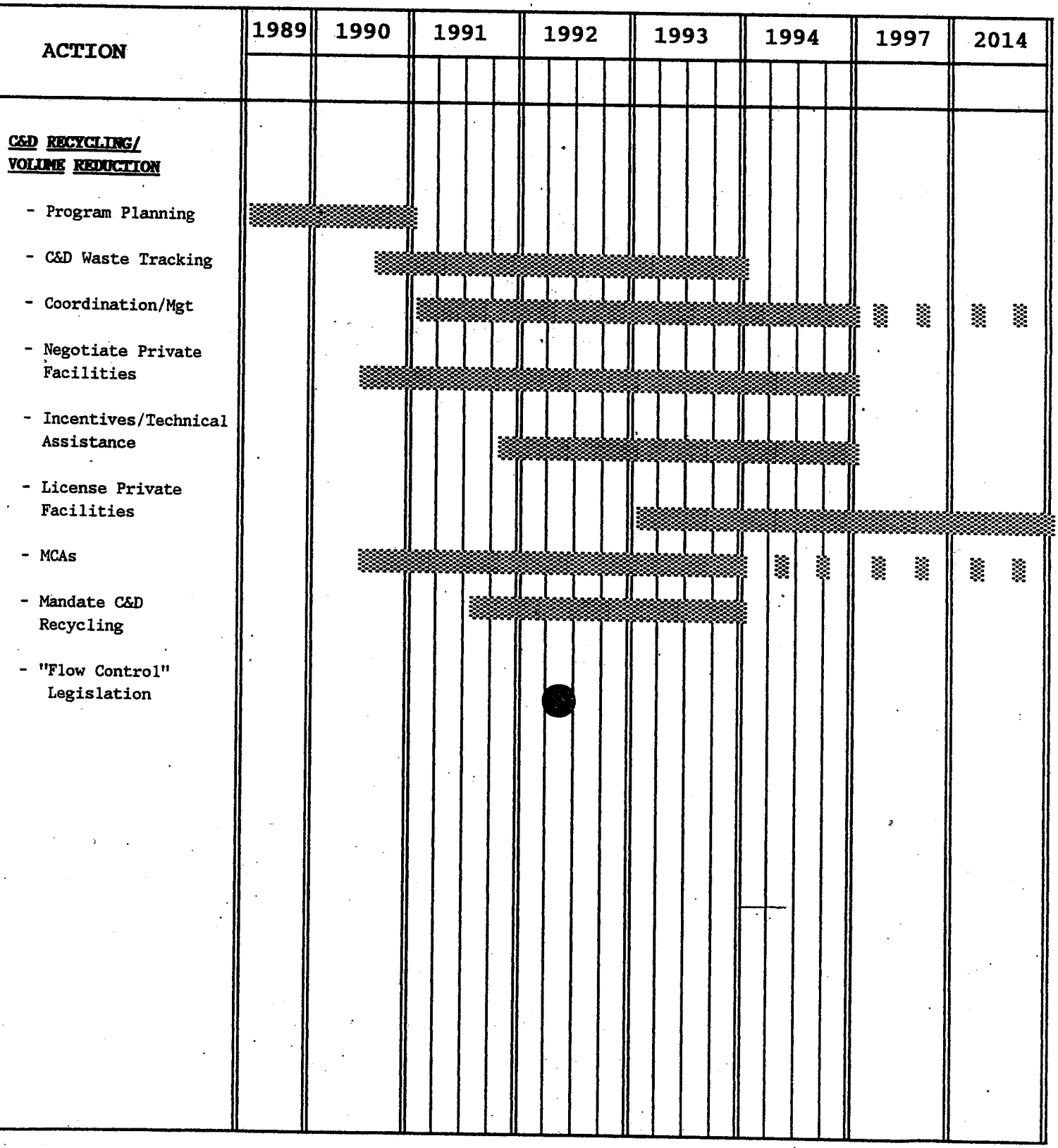
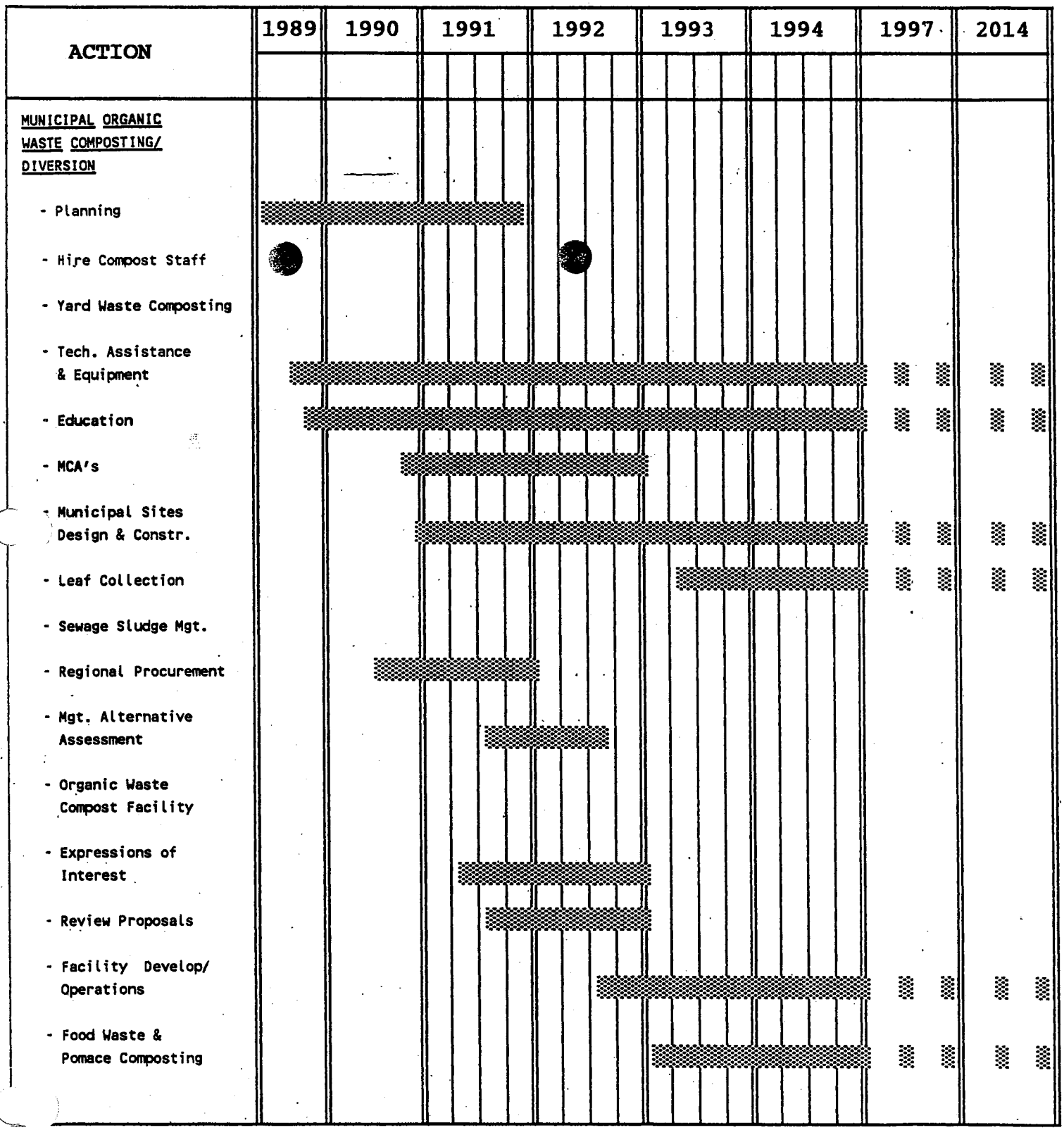
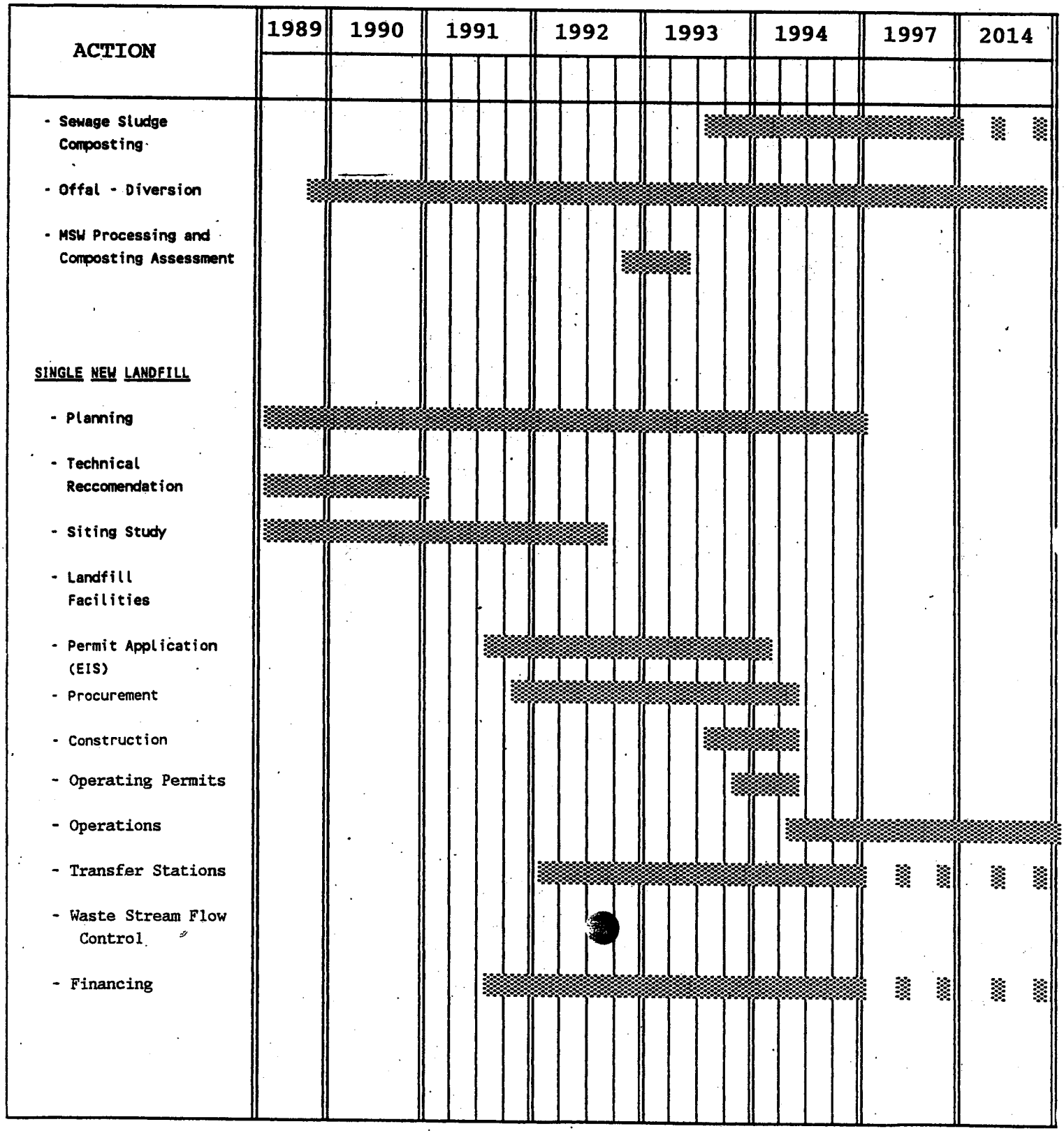


Figure ES-5 (Cont'd)



Action on going

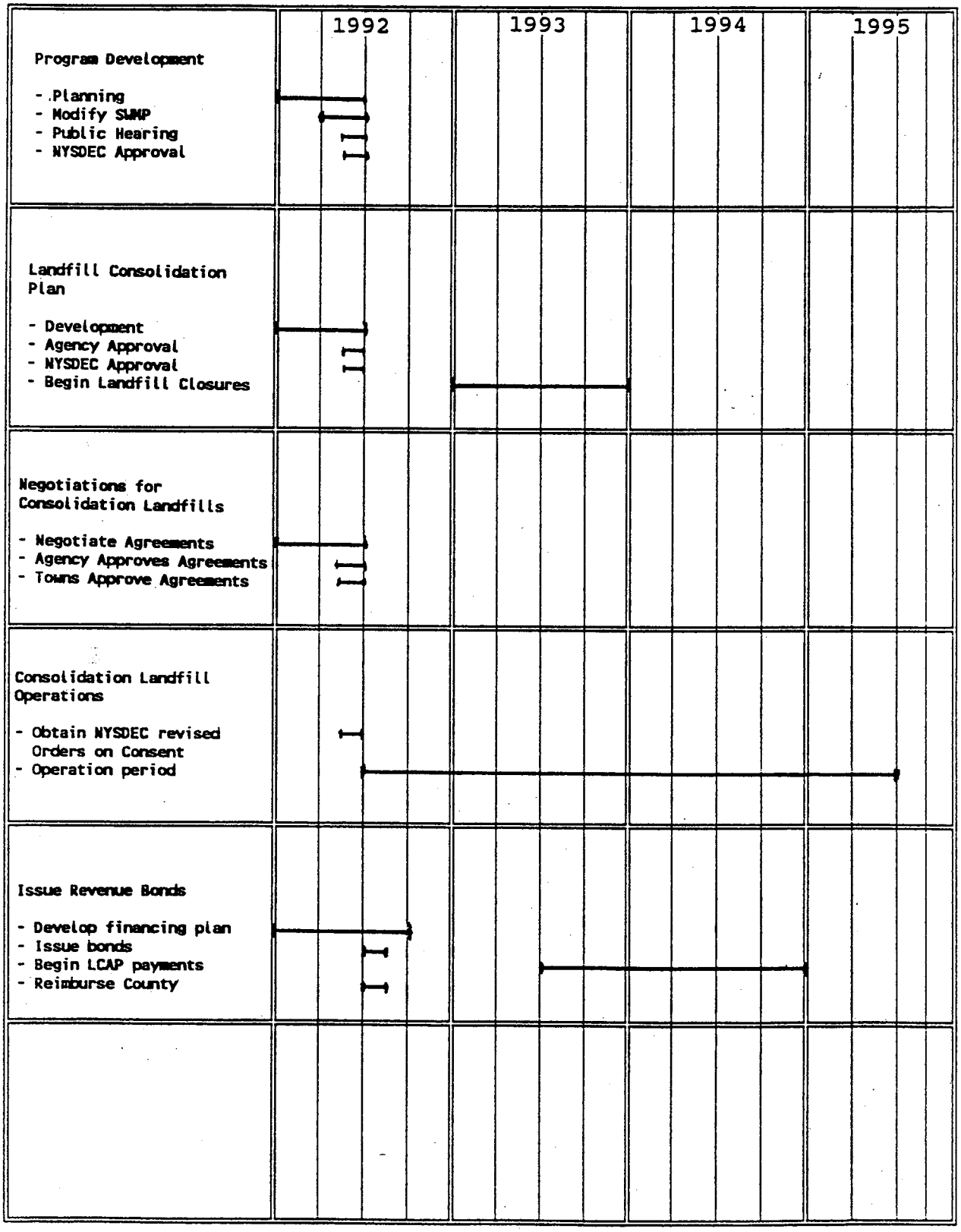
Figure ES-5 (Cont'd)



Action on going

(**Modification
Added 8/92)

FIGURE ES - 5 (con't)
IMPLEMENTATION SCHEDULE FOR
LANDFILL CONSOLIDATION PLAN (1992-1995)



- Multi-County Alternatives - This alternative would involve the planning and development of a regional solid waste management program for Ulster County and neighboring counties in the region.

Current landfilling practices, along with the present recycling efforts, cannot continue as the primary means of solid waste management since these landfills are under NYSDEC consent orders to close or be upgraded to meet environmental regulations in the immediate future (upgrading is generally precluded by the cost of compliance with current regulations).

(**Modification Added 8/92) **Existing landfills will be closed under a Landfill Closure Schedule developed by NYSDEC in accordance with conditions contained in the Orders on Consent. Many will close in the near future, and a few will be used to handle the Solid Waste stream until permanent facilities are constructed.** Present recycling efforts will not result in acceptable recycling levels. Direct implementation of a waste disposal facility would circumvent prudent planning efforts and fall short of SEQRA requirements. It is doubtful that an agreement with a privately owned and operated facility would provide the County with the necessary security that the solid waste services would be provided at justified cost over the planning period. Although the multi-county alternative may be a consideration in the future, currently required time frame and inherent risks to the County are prohibitive. It is, therefore, in the best interest of the County to develop and implement "The Plan".

SOLID WASTE STREAM ANALYSIS

One of the major components in developing "The Plan" is an analysis of the solid waste stream in terms of current and projected quantities and composition. This information is used to estimate the potential impacts of recycling, reuse, and waste reduction on the projected waste stream, and for sizing solid waste management facilities.

Sixteen solid waste components are discussed in "The Plan":

- Residential Waste
- Commercial Waste
- Non-Hazardous Industrial Waste
- Apple Pomace
- Grape Pomace
- Construction and Demolition Debris
- Sewage Plant Sludge
- Leaves and Yard Waste
- Water Plant Sludge
- Air Pollution Control Facility Sludge
- Offal
- Incinerator Residue
- Tires
- Waste Oil
- Contained Gaseous Material
- Power Plant Ash

1988 Solid Waste Quantities

A number of methods were used to estimate the quantity of solid waste generated in the County in 1988. These included field programs, contact with solid waste generators and haulers, and contact with State and local agencies and municipal representatives. Based on these methods, the estimated 1988 solid waste generation rate for the County is 645 tons per day (tpd) or 7.8 pounds per capita per day (pcd). Although this estimate may appear high, the Ulster County solid waste stream includes a number of components that are not typically included in solid waste stream estimates, such as sludges, offal, and pomace. The 1988 generation rate for components of the County's solid waste stream are as outlined in Figure ES-6 and ES-7 below:

FIGURE ES-6

Solid Waste Stream Component	1988 Waste Generation Rate (tpd)
Residential Waste	227
Commercial Waste	157
Non-Hazardous Industrial Waste	55
Apple Pomace	30
Grape Pomace	2
Construction and Demolition Debris	55
Sewage Plant Sludge	33
Leaves and Yard Waste	70
Water Plant Sludge	0
Air Pollution Control Facility Sludge	0
Offal	4
Incinerator Residue	0
Tires	5
Waste Oil	7
Contained Gaseous Material	0
Power Plant Ash	0
	645 tpd

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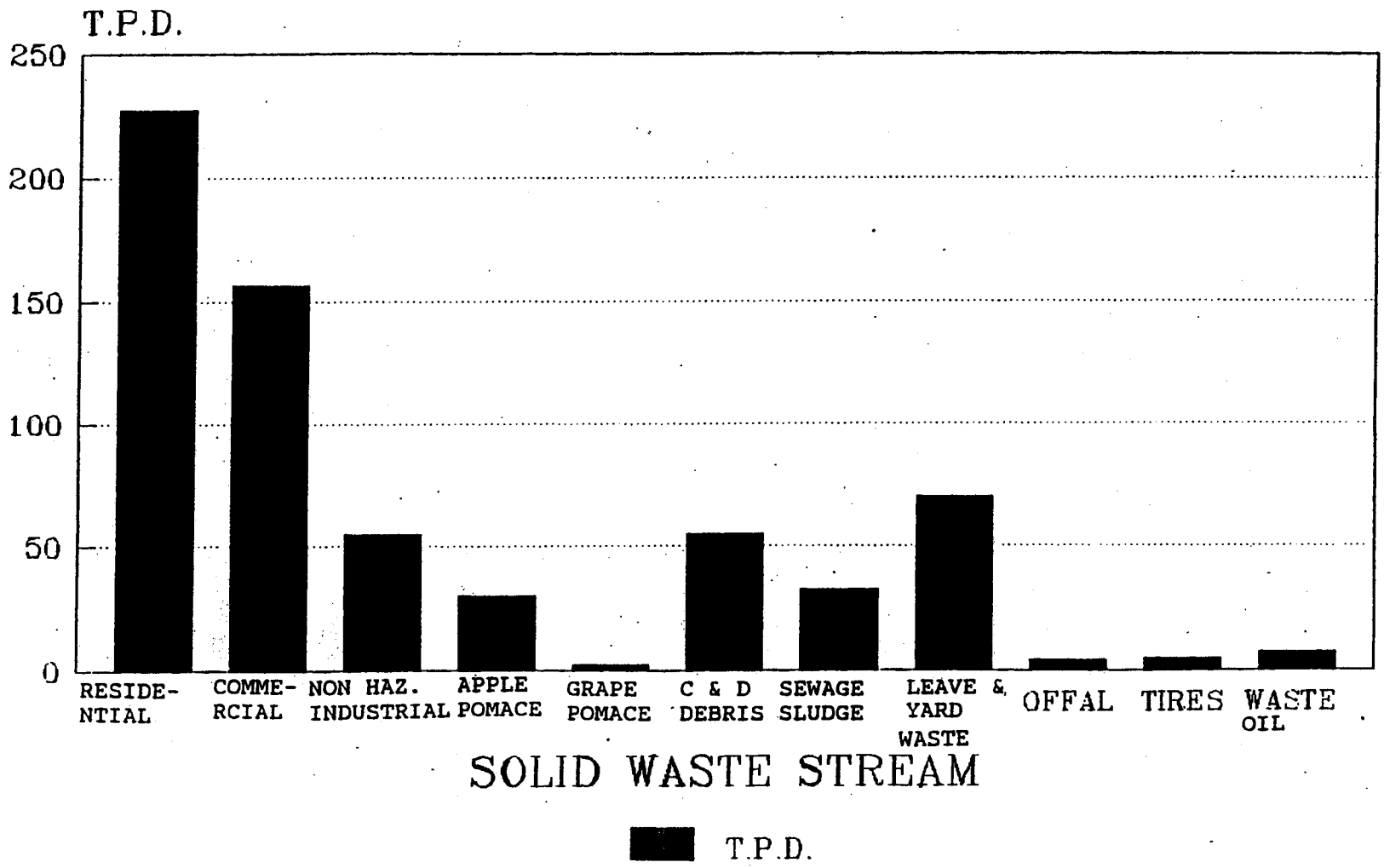
FIGURE ES-7

U.C. SOLID WASTE STREAM

EST. WASTE TONS PER DAY



EST. FROM 1988 FIGURES

composition of the County's residential and commercial waste, a two-phase waste sampling program was conducted. Figure ES-8 and ES-9 provide the breakdown of the County's residential and commercial waste stream.

Projected Solid Waste Quantities

Due to the potential impact of waste reduction, recycling, and reuse on the waste stream, waste quantity projections depend, in part, on projected waste composition. Waste quantity projections also are a function of population and per capita waste generation rates, the latter typically increasing about one percent each year. As a result, the solid waste generation rate for the County in the year 2004 is approximately 825 tpd, representing the total quantity of waste generated prior to waste reduction, reuse, and recycling. Figure ES-10 outlines the estimated and projected generation rates of solid waste by component for the years 1988, 1990, 1994, 1997, 2000, 2004, 2010, and 2014.

The Resultant Waste Stream

The resultant waste stream is that quantity of solid waste requiring disposal after waste reduction, reuse, and recycling. "The Plan" uses the projected solid waste generation rate at the midpoint of the 1994-2014 planning period, whereby, for example, the overall waste generation rate for the year 2004 is approximately 825 tpd. Approximately 50% of this overall figure is targeted for diversion through reuse and recycling, with a resultant solid waste stream of approximately 400 tpd of solid waste requiring disposal.

SOLID WASTE DISPOSAL TECHNOLOGY EVALUATION

Even after implementing a program which maximizes waste reduction, reuse, and recycling to the greatest extent practical, some solid waste will require disposal. "The Plan" contains a review of available solid waste disposal technologies.

The following assumptions were used to evaluate solid waste disposal technologies:

- Recycling and waste reduction is an integral part of solid waste management in the County.

FIGURE ES-8

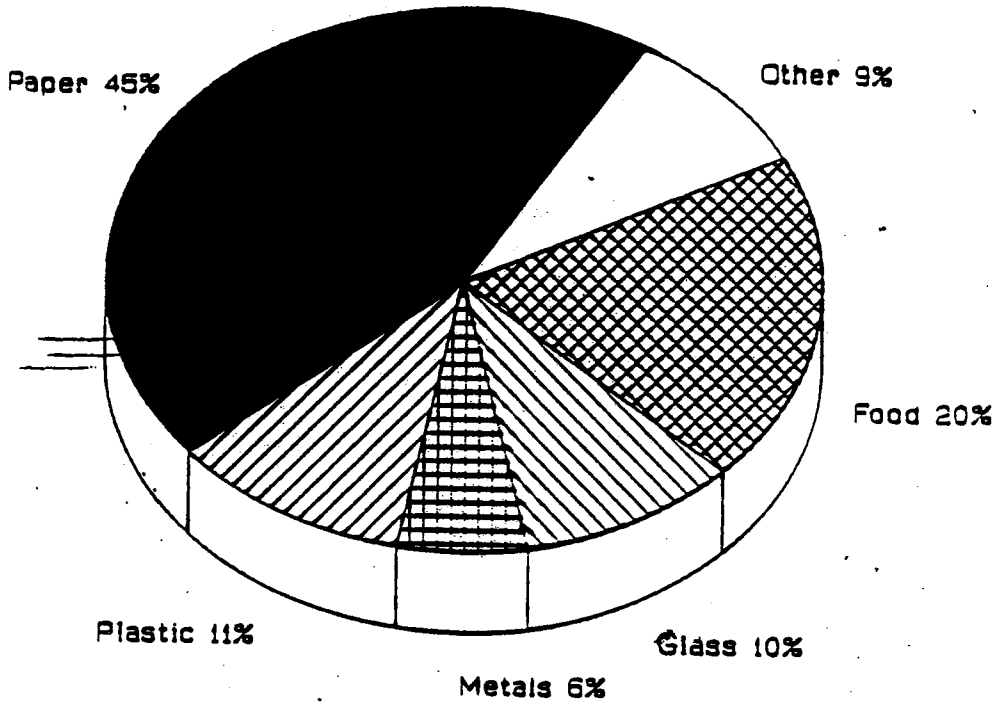
Comparison of Residential & Commercial Waste Composition (Tons Per Day)

	Residential (TPD)	Commercial (TPD)	Combined Residential & Commercial (TPD)	Percent of Waste Stream
WASTE STREAM				
Newspaper	21.906	5.809	27.7	4.3%
Corrugated Cardboard	3.223	24.414	27.6	4.3%
Mixed Paper	1.657	12.497	14.2	2.2%
Other Paper	74.683	46.723	121.4	18.8%
Plastic Bev. Containers	0.636	0.550	1.2	0.2%
Plastic Milk Bottles	0.999	0.141	1.1	0.2%
Other Plastic	9.784	8.305	18.1	2.8%
Plastic Film	12.939	9.137	22.1	3.4%
Aluminum Cans	0.295	0.911	1.2	0.2%
Other Aluminum	1.226	0.471	1.7	0.3%
Ferrous Scrap	1.725	5.699	7.4	1.2%
Tin Cans	10.510	1.900	12.4	1.9%
Textiles/Fabrics	9.557	0.848	10.4	1.6%
Food Waste	44.288	14.727	59.0	9.1%
Container Glass	22.382	13.267	35.6	5.5%
Other Glass	0.114	0.236	0.4	<0.1%
Wood	0.068	3.423	3.5	0.5%
Dirt & Debris	6.742	3.124	9.9	1.5%
Ceramics & Fines	2.815	0.722	3.5	0.5%
Rubber	0.477	0.298	0.8	0.1%
Leather	0.318	0.000	0.3	<0.1%
Miscellaneous	0.658	3.799	4.5	0.7%
Total Waste Stream	227.000	157.000	384.0	59.5%

FIGURE ES-9

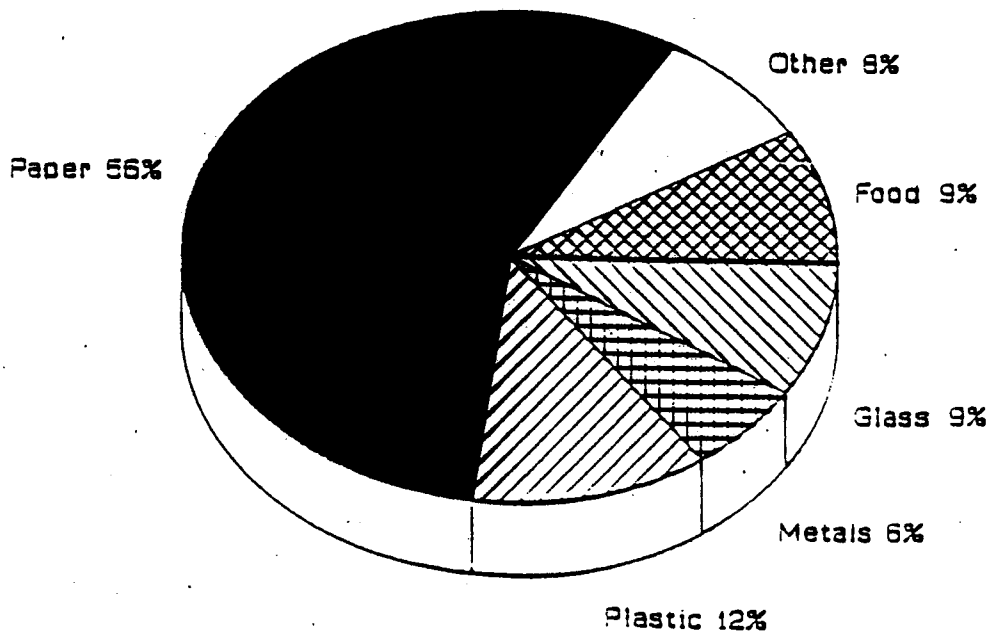
RESIDENTIAL WASTE STREAM COMPOSITION

% by weight



COMMERCIAL WASTE STREAM COMPOSITION

% by weight



- A primary objective of the technology evaluation is to reduce the amount of solid waste which will require landfill disposal, regardless of the technologies recommended in "The Plan".

- The technology evaluation focused on identifying technologies relevant to the resultant waste stream.

FIGURE ES-10

ESTIMATED AND PROJECTED GENERATION RATES BY SOLID WASTE COMPONENT (1)

Ulster County Solid Waste Stream Component	Tons per Day							
	1988	1990	1994	1997	2000	2004	2010	2014
Residential	227	232	244	239	258	268	281	290
Commercial	157	160	168	165	179	185	194	200
Non-Hazardous Industrial	55	56	59	58	63	65	68	71
Construction & Demolition	55	57	60	61	66	70	76	80
Leaf & Yard Waste	70	71	74	71	75	76	78	79
Tires	5	5	5	6	6	6	6	6
Sewage Treatment Plant Sludge	33	41	43	46	51	51	52	52
Water Treatment Plant Sludge(2)	-	-	-	4	4	4	4	4
Waste Oil	7	7	7	8	8	8	9	9
Apple Pomace	30	30	30	30	30	30	30	30
Grape Pomace	2	2	2	2	2	2	2	2
Offal	4	4	4	4	4	4	4	4
Subtotal:	645	665	696	693	746	770	803	827
Waste Reduction Excluding Returnable Beverage Container Law	0	6	22	58	40	56	82	102
Total:	645	672	718	751	786	827	886	929

(1) Columns may not add due to rounding.
(2) Water Treatment Plant Sludge production is assumed to begin in 1997.

The technological evaluation was conducted in several phases, and included the full spectrum of alternative technologies as grouped into these five categories:

- Material recovery systems;
- Biological recovery systems;
- Thermal recovery systems;
- Landfills; and
- Export to landfills.

These technologies were analyzed by evaluating environmental, technical, economic, and siting criteria in a four-phases approach as follows:

Phase	Evaluates	For These Factors	and Identifies
1.	Solid Waste Technologies	Technical	Candidate Technologies
2.	Candidate Technologies	Technical, Environmental, Siting	Acceptable Technologies
3.	Acceptable Technologies	Technical, Economic, Environmental	Preferred Technologies
4.	Preferred Technologies	Economic	Recommended Technologies

Figure ES-11 illustrates how the phased evaluation process was performed. Commercial availability, U.S. operating history, and compatibility with recycling were the Phase 1 criteria evaluated as part of the process.

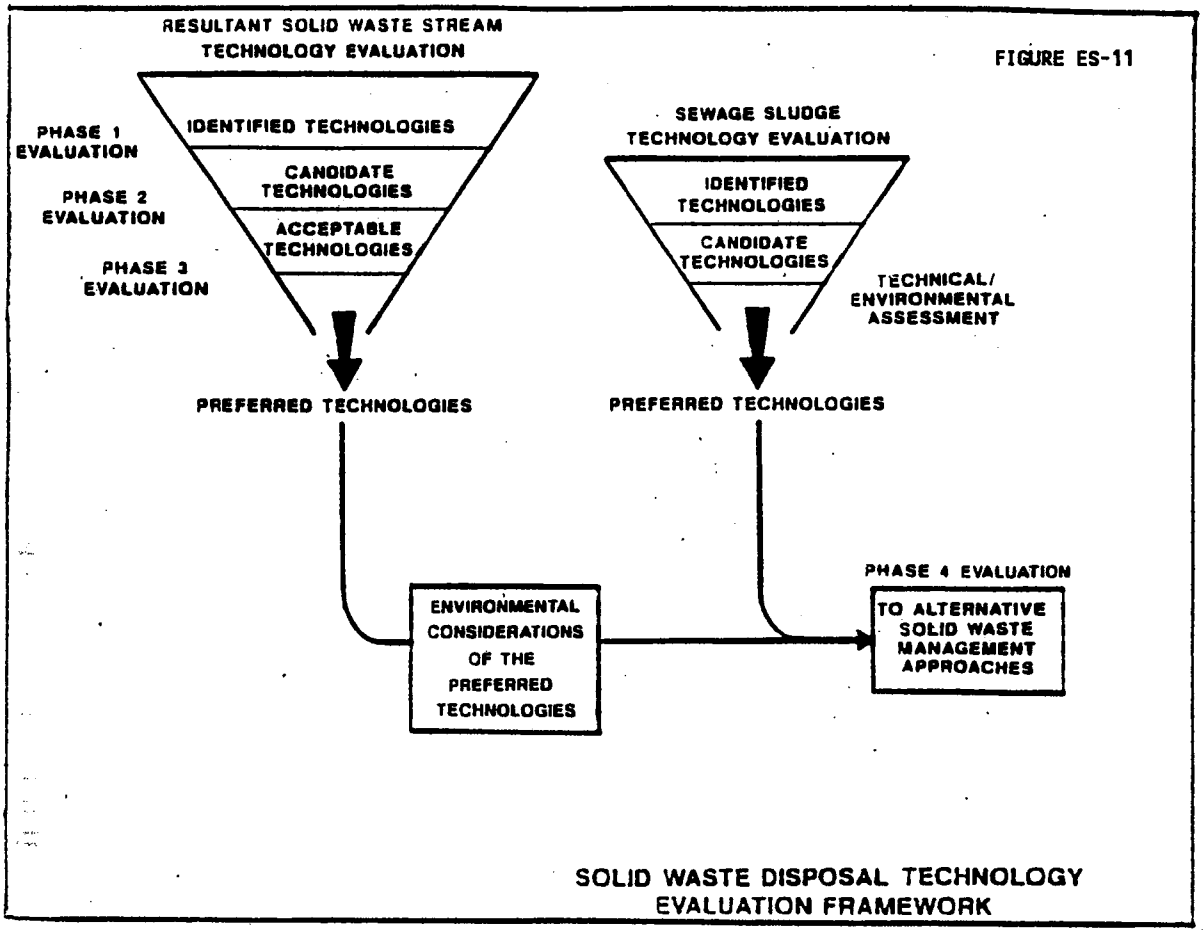
The application of these Phase 1 criteria, along with the Phase 2 and 3 criteria presented in Section 5.0 of the Plan, yields the recommendation of a combination of aggressive recycling programs and landfilling as the preferred technologies for the County. This combination offers life cycle costs that are lower than those associated with waste-to-energy alternatives.

In addition to the potential economic impacts, the following issues were considered in reaching a technology recommendation:

- The alternative of a landfill in combination with recycling provides the County with significant flexibility to accommodate variations in waste types and quantities.

- Since there has been no Countywide management of solid waste, there is no infrastructure from which to expand or develop a Countywide solid waste management program. The various parties which will be involved (i.e., municipalities, the public, haulers, UCRRA, and the County) have not yet developed the necessary working or contractual

relationships. Phased implementation of recycling programs coupled with phased landfill development provides the opportunity for these relationships to be developed over a reasonable period of time.



- The impact of recycling on the waste stream has not been firmly established, since implementation of recycling will be phased over several years. Because solid waste in the County has historically been disposed of in local municipal landfills which are not usually equipped with weigh scales, data on the County's solid waste stream is limited. This combination significantly complicates the sizing of a disposal facility to meet the needs of the County. A landfill offers greater flexibility in addressing these issues than does a waste-to-energy facility. As landfill construction is typically performed in phases, the capital commitment is spread out over time and can thus be modified to address changes in the program.

- Environmental and economic concerns regarding waste-to-energy, including concerns related to importation of solid waste from outside the County were also taken into account.

The above factors, in combination with the life cycle cost analysis, result in the identification of the landfill technology in combination with an aggressive recycling program as the approach for Ulster County. Further, as the Countywide program is implemented, the County should maintain sufficient flexibility in critical program elements, such as site selection, to allow for potential changes in legislative, regulatory, or economic conditions. Such flexibility will enable the County to consider and, if appropriate, implement alternative technologies without jeopardizing its effective solid waste processing and disposal capacity. For example, in addition to the implementing landfill/recycling programs, UCRRA has determined to request private vendors to submit proposals for the development of a municipal organic solid waste compost facility. With the landfill/recycling programs in place, such a facility could benefit the County by extending the life of the landfill.

ENVIRONMENTAL SETTING

Two physiographic provinces, the Valley and Ridge province and Appalachian Plateau dominate the geology and topography of Ulster County. This terrain, in which streams have eroded steep valleys to create the Catskill Mountains, has resulted in the concentration of residential and commercial development in the valleys with a radial pattern of highways extending from the County seat in Kingston.

Ulster is a typical Catskill county in that it has few large, natural waterbodies. Reservoirs have been developed in many of the available watershed basins, however, to serve local communities as well as New York City. The largest supplies of ground water in the County are available from unconsolidated sand and gravel deposits. These glacial outwash and recent alluvial deposits generally occur in river valleys and are of relatively limited aerial extent.

There are many freshwater wetland habitats, with major wetland areas located in the eastern and southern part of the County. Ecological relationships are varied and extensive, as the Hudson River, Catskill Mountains, and large relatively undeveloped areas provide for a wide range of terrestrial and aquatic flora and fauna.

The County is located in the short summer, humid continental climatic region, modified locally by the Catskill and Shawangunk Mountains and the Hudson River. In terms of air quality, Ulster County is in the Hudson Valley Intrastate Air Quality Control Region, and currently is within regulatory limits for all criteria pollutants.

The majority of the County's population and development is located in the eastern portion of the County. The Catskill Mountains and Hudson River provide the basis for a wide range of tourism and recreational activities, including summer resorts and ski centers.

LANDFILL SITING

UCRRA's initial siting study focused on finding sites for co-located facilities. A modified, supplemental analysis focused on siting a landfill only. That analysis looked at areas of the County containing glacial-lacustrine clays. The study followed the strictures of 6 NYCRR Part 360 for landfill siting and used a comparative analysis to evaluate the candidate areas.

The study applied exclusionary criteria and screening criteria to the County. One of the more significant screening criteria was the criteria for size, namely that a 100 acre area was determined to be the minimum size needed for a state-of-the-art landfill with auxiliary facilities.

After the application of the exclusionary and screening criteria to the areas of the County containing lacustrine clay deposits, 23 potential candidate areas were identified which were determined to be reasonable and appropriate for landfill development.

Based upon its hard look at the siting issues and analysis of public comment received during the process, UCRRA concluded that additional on-site testing will be performed as part of the next phase of landfill siting work. UCRRA has also determined that the initial issues to be considered in this further study include issues of soil stability, hydrogeology of soils, and archeological sensitivity of candidate areas.

UCRRA has determined to conduct on-site review in the form of a supplemental to the Final GEIS as provided in 6 NYCRR Part 617.15(c) and to conduct scoping sessions to determine the scope of such on-site testing. The landfill siting analysis is discussed in Section 8 of "The Plan".

POTENTIAL ENVIRONMENTAL IMPACTS

Potential environmental impacts associated with the implementation of solid waste management facilities are described in Section 10 of "The Plan", and include:

- Air quality
- Surface water
- Ground water
- Health effects
- Noise
- Soil erosion and sediment control
- Odor, litter, vectors, and fugitive dust
- Traffic
- Archaeological and historic resources
- Ecological resources
- Socioeconomic
- Aesthetics

Site and program specific EIS's will be prepared as part of implementation of "The Plan" will evaluate these impacts in more detail.

MITIGATION MEASURES

"The Plan" identifies recommended technologies, designates candidate areas and presents generic mitigation measures, to be detailed and developed in the site and program specific EIS's. The following is an overview of mitigation measures which could be implemented to reduce or eliminate impacts.

Surface and Ground Water Control

Impacts on the quality and/or quantity of surface and ground water from the construction and operation of solid waste management facilities are expected to be low. Controls mandated by regulatory requirements eliminate or minimize potential impacts. Areas to be addressed would include soil erosion controls; drainage patterns; water supply sources and requirements; wastewater collection, treatment, and disposal; and storm water control.

Noise

There are number of methods to control or reduce noise associated with construction and operation of solid waste management facilities, including vibration reduction, enclosure of the noise source, and absorption of sound by

natural and/or man-made barriers. Noise can also be controlled by regular maintenance of equipment and the use of sound bafflers such as mufflers on mobile equipment. Scheduled hours for the acceptance of solid waste deliveries can also reduce noise impacts on residential areas.

Household Hazardous Waste Control

The solid waste management program can mitigate household hazardous waste through public education, household hazardous waste collection, recycling and disposal, and operator training. Although removal of household hazardous wastes from the waste stream will be emphasized prior to delivery to the solid waste management facilities, operators there should be trained to identify and remove any suspicious or unacceptable materials.

Loss of Habitat

Habitat loss will depend upon site development and the types of ecological communities present on the site. In the event that valuable habitat were to be significantly impacted or lost as through project development, a compensating mitigation plan would be developed.

Traffic

Traffic impacts will be a function of the site selected for development, and subsequent studies would determine any necessary mitigation measures.

Aesthetics

Mitigation measures for aesthetics are also site specific and would be addressed in a site and program specific EIS. Such measures typically involve the use of buffer, vegetation, and topography to minimize the visual impact of the facilities.

Air Quality

Air quality is especially related to the selected technology and site, requiring mitigation measures to be described in a site and program specific EIS.

Land Use

While such mitigation is also a function of the selected site and technologies, precautions should be taken to create compatible land use. The development of this "Plan" is in itself a mitigation measure, however, since landfilling which currently occurs at 15 municipal landfills would be consolidated at one location and reduce the amount of land used to manage the County's solid waste.

UNAVOIDABLE ENVIRONMENTAL IMPACTS

As with mitigation measures, unavoidable environmental impacts would be addressed in detail in site and program specific EIS's.

Based on the impacts and the mitigation measures described in Section 10.0 of "The Plan", the proposed action would substantially eliminate potential adverse environmental impacts associated with continuing the existing landfills. Additionally, reusable materials would be recovered from solid waste through the proposed recycling and composting facilities.

Unavoidable adverse impacts may include noise, fugitive dust, soil erosion, and engine exhaust fumes during construction and operation of the facilities.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Development of "The Plan" would consume or otherwise render unavailable for future use certain natural and man-made resources. Benefits of replacing existing landfill practices with the proposed technologies, however, far outweigh the resources that will be consumed.

USE AND CONSERVATION OF ENERGY

The current objective is to identify an appropriate alternative to the County's 15 operating, non-complying landfills. Thus, energy consumed by construction and operation of the facilities would be offset to some extent by the recycling and composting which followed. It is premature, however, to discuss energy conservation methods in detail, until the specific technologies have been analyzed in subsequent site and program specific EIS's.

GROWTH INDUCING ASPECTS

Residential or commercial/industrial development of a parcel of land would contain growth-inducing aspects. The development of a Countywide solid waste management plan, while it does not appear to have any significant growth-inducing impacts, provides for the necessary service of solid waste disposal.

IMPLEMENTATION APPROACH

The implementation of a solid waste management program involves a number of institutional issues in addition to technical considerations, including:

- Solid waste stream flow control
- Facility procurement
- Facility ownership
- Host community program
- Financing and funding assistance

Control over the waste stream is necessary to ensure that it will be delivered to the appropriate processing or disposal facility. Contractual, legislative, and economic methods are typically available for obtaining such control. The financial community typically requires not only put or pay provisions, which identify the payment obligation, but also the establishment of a legal authority to control the waste. These needs often cause communities to combine contractual and legislative control of the solid waste stream. "The Plan" recommends a put or pay contract between the Agency and the County and the adoption of waste stream control legislation by the County Legislature.

Facility procurement typically involves one of these procurement methods:

- Conventional architect/engineer
- Turnkey
- Full service with private ownership
- Full service with public ownership

Each of these methods involves different approaches and therefore different risks. The conventional architect/engineer approach involves formal bids and the award of the contract to the lowest bidder. Typically, an architect/engineering firm prepares the design and bid documents, contractors bid on the construction of the project, and the operation of the facility is performed by the municipal entity or another private contractor.

In a turnkey procurement, one contractor is responsible for design, construction, and testing of the facility, with operation of the responsibility of the municipal entity. A full service procurement places the responsibility for design, construction, and operation on one contractor.

A full service procurement approach can be utilized with either public or private ownership of the facility. While private ownership has historically been utilized for related economic benefits to pass back to the municipality, recent changes to the tax code, notably the 1986 Tax Reform Act, have significantly reduced these advantages. Since the community has the ultimate responsibility for disposal of the solid waste, many communities now considering full service procurement opt for public ownership, to retain a greater degree of control over the facility. "The Plan" recommends public ownership of major facilities.

Regardless of the approach selected, the procurement of solid waste management facilities in New York State is regulated by General Municipal Section 120-w.

Facility Ownership

The selection of ownership (Public v. private) should take into account the need for control over the project, the allocation of risks, and the economic benefits associated with each approach. Public ownership offers a greater degree of control, which is important in long-term projects that address significant environmental issues and involve substantial capital and operating expenditures. Private ownership allocates more of the operating risks to the private vendor, but the community will continue to have the ultimate responsibility for disposal of its solid waste should the vendor be unable to fulfill its obligations. In addition, the economic considerations of ownership should be addressed (i.e., equity contribution from a private owner vs. municipal ownership of the facility after retirement of a bond issue or other project debt). The Plan recommends public ownership of the recycling and landfill facilities.

Host Community Plan

At least one municipality will eventually serve as the host community for County solid waste management facilities. Since these facilities will serve the entire County, a host community plan should be established for that community. Such plan may include:

- Property Tax Payments - An economic benefit that can be structured as actual property taxes for a privately owner facility or as a payment in lieu of taxes for a publicly owned facility.

- Local Infrastructure Improvements - Such benefits can include roads, water or wastewater systems, recreational facilities (i.e., parks, swimming pools, ball fields, etc.), and municipal facilities.

- Payment per Ton - This benefit involves the payment of monies to the community for each ton of solid waste delivered to the facility. In the case of the County, the act that created the UCRRA includes a provision for a payment per ton of up to $1.25.

These and other approaches should be considered in developing a general host community program, which could then serve as the basis for negotiating a specific plan with the host community. Negotiations could be conducted by committees from the UCRRA and the governing body of the host community.

Financing and Funding

The construction and operation of solid waste management facilities involves substantial capital expenditures and operating budgets. Generally such facilities can be financed from public sources, or a combination thereof. Financing sources for solid waste management facilities include:

- General Obligation bonds
- Industrial Development bonds
- Revenue bonds
- Leveraged Leasing
- Private Equity

"The Plan" provides for the issuance of revenue bonds to provide the necessary financing to implement "The Plan". A specific financing plan will be developed as part of the implementation of "The Plan", since issues such as procurement method and ownership approach will play significant roles in identifying the preferred financing plan.

REGULATORY REQUIREMENTS

The proposed action must comply with all applicable environmental laws and regulations. Permits under Part 360 will also be required for the construction and operation of the solid waste management facilities.

PUBLIC PARTICIPATION

UCRRA developed "The Plan" pursuant to SEQRA and with full participation by members of the public. Section 11 of the Plan describes the public participation history in connection with "The Plan" development.

UCRRA will continue to undertake its activities emphasizing full use of public participation opportunities pursuant to SEQRA and the New York State Open Meetings Law.

UCRRA will also continue its communication with surrounding counties to assess the benefits of regional cooperation.

1.0 DESCRIPTION OF ACTION

1.0 DESCRIPTION OF ACTION

1.1 BACKGROUND:

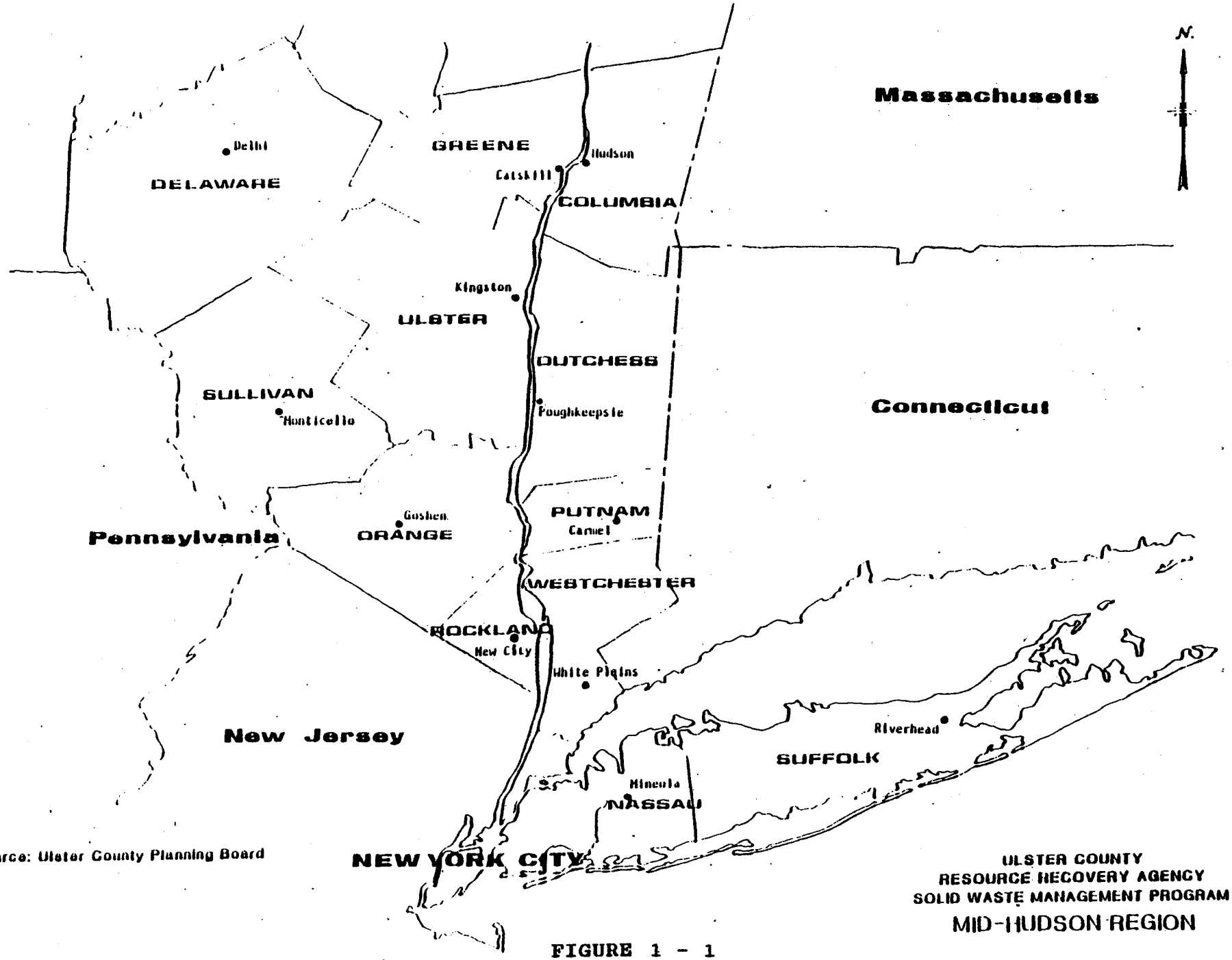
Ulster County is located in the Mid-Hudson Valley region of New York State (the "State") approximately 90 miles north of New York City, and 50 miles south of Albany. The County is bordered on the east by the Hudson River, on the south by Orange County, on the west by Sullivan and Delaware Counties, and on the north by Greene County (see Figure 1.1). The County covers approximately 1,140 square miles. In 1988, the population of the County was approximately 166,000 and is expected to increase to approximately 184,000 by 2010, according to the New York State Department of Commerce (NYSDC). Although both NYSDC population projections and Ulster County Board projections are based on US Bureau of the Census data, NYSDC projections are used in this report.

The economic base of the County varies and is made up of industrial, commercial, retail service (including tourism), governmental (state and institutional) and agricultural employers. The labor force of the County is employed in a variety of industries including manufacturing, construction, transportation, public utilities, trade, finance, real estate, service industries, and governmental institutions.

There are 24 municipalities in the County: 3 villages, 1 city, and 20 towns. Currently, the method of disposal for most of the solid waste generated in the County is landfilling, with 15 municipal landfills in operation excluding the Jockey Hill landfill which was utilized by the City of Kingston prior to being closed in April 1988. The other municipal landfills are scheduled to close during the next 3-5 years

Historically, the municipalities of Ulster County were individually responsible for managing solid waste. Each community developed its own strategy, which generally meant building a landfill. In some communities, solid waste was collected and hauled to landfill by the municipal government or private companies. In others, the residents brought solid waste to the landfill themselves. There was no coordinated Countywide system for solid waste management and cooperation between municipalities was rare.

In the mid-1980's, after new initiatives to close non-complying existing landfills were undertaken by NYSDEC and strict requirements for the siting, construction,



Source: Ulster County Planning Board

ULSTER COUNTY
RESOURCE RECOVERY AGENCY
SOLID WASTE MANAGEMENT PROGRAM
MID-HUDSON REGION

FIGURE 1 - 1

and operation of new disposal facilities were enacted, many communities found it beyond their financial and managerial capability to continue to dispose of solid waste in traditional ways.

Consequently, many of the local governments in Ulster County requested that the Ulster County government assume the responsibility for solid waste management. In 1986, the Ulster County Legislature obtained authorization from the State Legislature for the creation of the UCRRA, a public benefit corporation which was formed for the purpose of developing, financing, and implementing a comprehensive Countywide solid waste management program.

The UCRRA was created by the New York State Legislature pursuant to Chapter 936 of the Laws of 1986, as amended (the "Act"). The UCRRA became effective on March 1, 1987 when its first members were appointed by the Chairman of the Ulster County Legislature. The UCRRA was created to manage solid waste in the County. Figure 1-2 depicts UCRRA's organizational structure. Under Section 2050-b (15) of the Act, the UCRRA is responsible for developing a Solid Waste Management Program to manage:

> **"All materials or substances discarded or rejected as being spent, useless, worthless, or in excess to the owners at the time of such discard or rejection including but not limited to:**
> **- air pollution control facility sludges**
> **- garbage**
> **- water pollution control facility sludges**
> **- refuse**
> **- water supply treatment facility sludges**
> **- rubbish**
> **- contained gaseous material**
> **- industrial waste**
> **- incinerator residue**
> **- commercial waste**
> **- demolition and construction debris**
> **- ashes**
> **- offal"**

In addition to the solid wastes defined in the Act, the UCRRA also requested that an evaluation of apple pomace, grape pomace, leaves and yard waste, tires, and waste oil be included in this report. UCRRA has also developed a program for the proper management of household hazardous wastes which are a component of the residential waste stream. Table 1-1 lists the 16 components of the County's waste stream that are specifically addressed in the Plan.

ULSTER COUNTY RESOURCE RECOVERY AGENCY

1991 ORGANIZATIONAL STRUCTURE

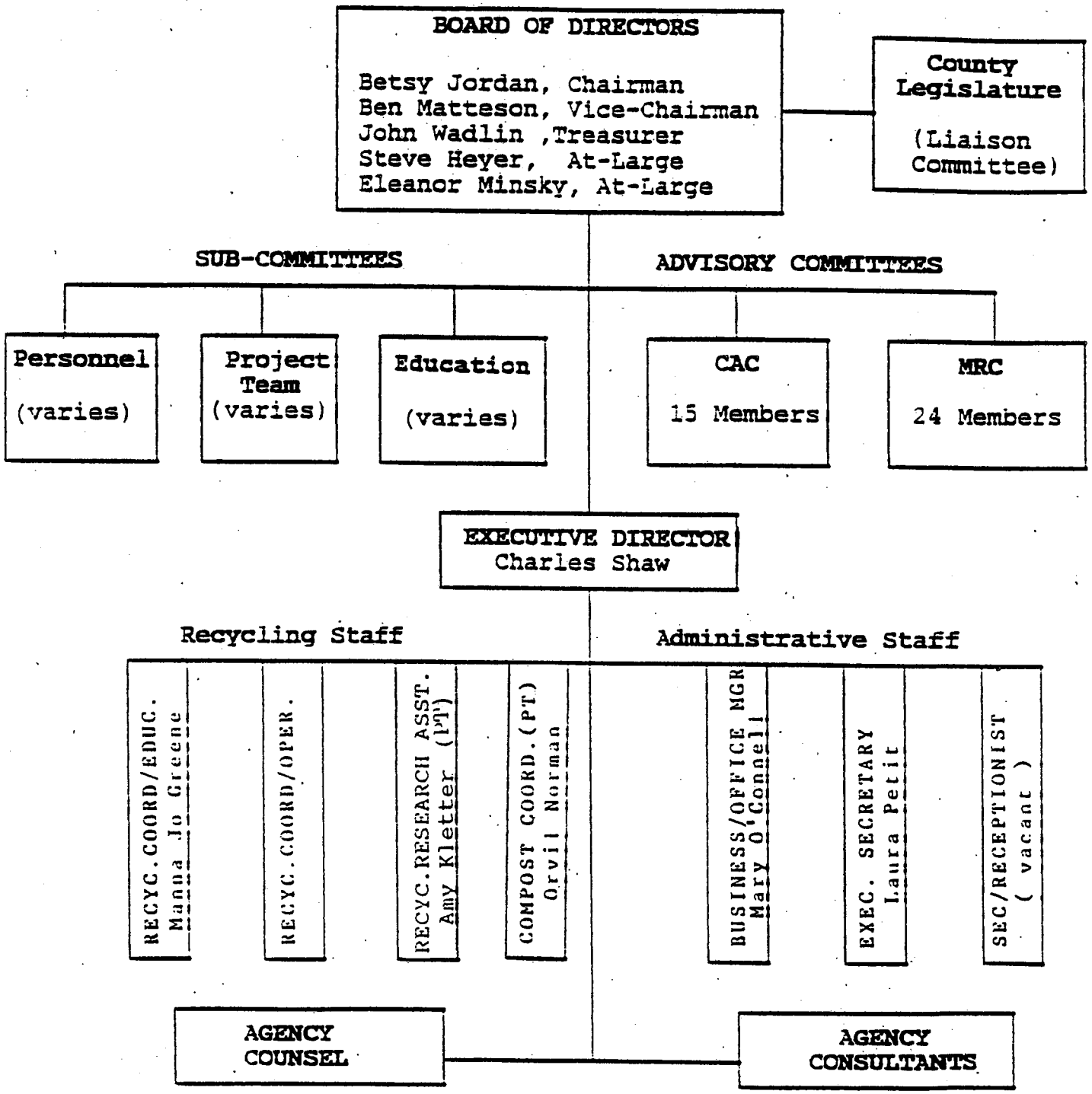


FIGURE 1-2

TABLE 1-1

SOLID WASTE STREAM COMPONENTS

Residential Waste	
Commercial Waste	**Offal**
Air Pollution Control Facility Sludges	**Incinerator Residue**
Non-Hazardous Industrial Waste	**Apple Pomace**
Construction and Demolition Debris	**Grape Pomace**
Sewage Plant Sludges	**Tires**
Leaves and Yard Waste	**Waste Oil**
Contained Gaseous Material	**Ashes**
Medical Waste (added in 12/90)	**Water Plant Sludges**

Not included under UCRRA's responsibilities are sewage and other highly diluted water-carried materials or those substances in gaseous form, special nuclear or by-product material within the meaning of the Atomic Energy Act of 1954 (as amended), or waste which appears on the list of hazardous waste promulgated by the Commissioner of Environmental Conservation pursuant to Section 27-0903 of the Environmental Conservation Law

For a complete discussion of current Solid Waste Management practices and problems experienced by Ulster County and its municipalities, the reader is referred to:

a) Chapter 2.0 of this Document
b) DGEIS - Volume 1 Sections 1.0 and 2.0
c) DGEIS - Volume IV (RAP) Section 2.0

1.2 OBJECTIVES

The primary goals considered in preparing the Solid Waste Management Plan for Ulster County are as follows:

- Provide a solution that makes the most sense, both environmentally, socially, and economically;
- Provide a solution that is capable of serving Ulster County for at least the next 20 years;
- Provide a solution that maximizes to the extent economically and technically practical, the waste reduction, recycling, and reuse of all components of Ulster County's waste stream;
- Provide a solution that complies with the State Solid Waste Management Act of 1988, the State's Solid Waste Management Plan, and 6 NYCRR Part 360 regulations; and

- Provide a solution that addresses the historic, current, and future solid waste management problems experienced by the County.

In an effort to meet these goals, UCRRA has prepared a detailed Findings Statement which provides the basis upon which the UCRRA and the County may take certain actions to approve a solid waste management plan and to implement a solid waste management program over the next several years. In the Findings Statement, UCRRA has recommended that action be taken in the following six areas:

1) Approve and authorize a comprehensive solid waste management plan for the County;

2) Establish and implement a Countywide reduction, reuse, and recycling program;

3) Select a single Countywide landfill disposal facility as the primary solid waste disposal strategy;

4) Site a Countywide landfill disposal facility;

5) Develop a host community program; and

6) Establish a methodology for development and implementation of future actions.

These findings are based on the studies prepared under the SEQRA process and set forth in the Draft and Final GEIS and the Supplemental Draft and Supplemental Final GEIS (collectively, the "SEQRA Documents").

1.3 ALTERNATIVES TO PROPOSED ACTION

During the research on possible components for the solid waste plan, several alternative actions were considered. These possibilities were rejected because they did not meet the objective of providing a long-term solution, that is environmentally and economically sound. However, SEQRA requires that reasonable alternatives that achieve the same or similar objectives, have relatively the same or reduced adverse environmental effects, and can be implemented in a time frame similar to that of the proposed action be given consideration.

Following is a summary of the alternative actions that were evaluated and rejected. For detailed discussion of these actions, the reader is referred to:

a) DGEIS, Sections 2.0 and 3.0
b) Findings Statement, Sections 1.0, 3.2, and 3.4

NO ACTION: In facing a project this costly, some people would say there's another option: "Do nothing." But that does not provide a long-term solution. It would delay decisions that would have to be made eventually in facing this problem and would add to the costs. If Ulster County supported the do-nothing approach, then it should be realized that this eventually would be more costly. Local municipalities would continue to be responsible for their solid waste and landfilling at the existing municipal landfills would probably continue, at least initially, as the primary means of waste disposal.

IMMEDIATE IMPLEMENTATION ALTERNATIVE: The County could forego program planning and move directly to the acquisition of a site(s), selection of a technology(s), procurement of vendor services, and construction of solid waste management facilities. Direct implementation of a waste disposal facility would not meet the requirements of SEQRA, nor would it ensure the development of an environmentally sound waste disposal facility. Furthermore, it would not meet the requirements of the Solid Waste Management Act of 1988. The immediate implementation alternative is not a feasible alternative to the development of a solid waste management program.

RELIANCE ON THE PRIVATE SECTOR: This alternative would involve entering into an agreement with a private company for disposal or processing of solid waste either in another County or State, or within Ulster County. However, private sector contracts are not a reliable, risk-free alternative. First, no existing private facility with adequate capacity exists within the region. The Al Turi landfill in Orange County has a present site life of approximately 5 years. Transportation costs to the landfill would be extremely high, and when added to the burden of administering the transportation of solid waste over long distances, the conclusion is that this is not a viable alternative.

MULTI-COUNTY ALTERNATIVES: This alternative would involve the planning and development of a regional solid waste management program for Ulster County and neighboring counties in the region.

Many of the counties in the Mid-Hudson Valley Region are at various stages of developing and implementing solid waste management programs. Like Ulster County, these counties are faced with stricter waste disposal regulations, and limited remaining disposal capacities.

Although the development of a cooperative regional waste disposal plan has merit, these efforts have not been historically successful in the absence of a central governing authority responsible for implementation of the project. Some of the risks the County may face if it participated in a regional waste disposal plan include extending the implementation schedule beyond a time-frame acceptable to the County; having to bear such consequences as implementation costs should the other county(ies) lose interest in the project; and forfeiting control over sensitive project issues. Some of the project issues that the County may lose control of by entering a regional plan include site and technology selection, establishment of disposal fees, and exclusion of Ulster County municipalities from disposal at the regional facility (ies).

Current landfilling practices, along with the present recycling effort, cannot continue as the primary means of solid waste management since these landfills are under NYSDEC consent orders to close or be upgraded to meet environmental regulations in the immediate future (upgrading is generally preluded by the cost of compliance with current regulations).

*Modification Added 8/92)

Selected existing landfill will only be used on a temporary basis for disposal of Solid Waste until permanent facilities are constructed. Present recycling efforts will not attain the State goal. Direct implementation of a waste disposal facility would circumvent prudent planning efforts and fall short of SEQRA requirements. It is doubtful that an agreement with a privately owned and operated facility would provide the County with the necessary security that the solid waste services would be provided at a justified cost over the planning period. Although the multi-county alternative may be a consideration in the future, the currently required time-frame and inherent risks to the County are prohibitive. It is, therefore, in the best interest of the County to develop the "Plan".

1.4 THE STATE'S PRIORITIES:

The Solid Waste Management Act of 1988 establishes the State's policies and strategy for managing solid waste and includes a State Solid Waste Management Priorities or "hierarchy" as follows:

NYS SOLID WASTE PRIORITIES

1. **Reduce the Amount of Solid Waste Generated**
2. **Reuse & Recycle Materials to the Maximum Extent Practical**
3. **Waste-to-Energy Systems**
4. **Landfills**

The State's top priority is to maximize, to the extent economically and technically practical, waste reduction, recycling, and reuse efforts. This is the County's top priority as well. The State won't issue permits for facilities such as landfills until a County can satisfactorily demonstrate its commitment to recycling. The third priority is using waste-to-energy plants. The fourth priority is given to landfills.

The State's policy is to reduce the dependence on landfilling by developing an integrated solid waste management program. The State's goal is to close landfills which are polluting the environment and replace them where necessary, and only after consideration of preferred solid waste management hierarchy, with state-of-the-art landfills.

The State encourages decreased dependence on landfilling and has set new, stringent environmental standards for landfill construction, including a liner system of two synthetic and two clay liners with a backup method for capturing the contaminated water called "leachate".

In addition, State policy further specifies that Solid Waste Planning Units, such as counties, must contribute to Solid Waste Management by providing programs which promote waste reduction and recycling. The State's policy for Solid Waste Management has been addressed in the Final GEIS and in the Integrated Solid Waste Management Plan presented in Chapter 9.0 of this document. It demonstrates that the County fully supports the institution of waste reductions measures. In conjunction with waste reduction measures, the development and implementation of aggressive recycling programs are targeted to maximize recycling to the greatest extent technically and economically practical. This should bring Ulster County beyond the State goal of 50 percent reduction/recycling/composting of the waste stream by 1997.

The Solid Waste Management Act of 1988 also identifies areas that should be addressed in local Solid Waste

Management Plans. Appendix B of the DGEIS and various sections of this document describe UCRRA's compliance with 6 NYCRR Part 360 Plan content requirements.

**Modification Added 8/92)

It is the intention of the Agency to take control of the Solid Waste stream during the interim period. After the passage of waste stream control legislation by the County Legislature, the Agency will develop a Landfill Consolidation Plan which will provide for the coordinated closure of existing landfills and the use of three municipal landfills during the interim period. The landfills will be operated by the Agency pursuant to revised NYSDEC consent orders until permanent facilities are constructed. Interim Satellite Aggregation Centers will be established to handle recyclable materials until permanent facilities are constructed. As more fully described in Chapter 9.0, the countywide recycling programs are scheduled to be implemented on a "fast track" basis and, accordingly, should address a portion of the waste stream, prior to the County's entire solid waste management program becoming fully operational (ie., prior to operation of a Countywide landfill).

The development of a solid waste management program for the County requires an extensive planning process that covers issues that are important to all residents. These issues include implementing a viable Countywide recycling program, selecting a waste disposal technology, identifying a site(s) suitable for waste processing and/or disposal, and implementing the financial and legislative components of the solid waste management program. It is also the goal of this Plan to review the environmental, social, and economic impacts of the comprehensive solid waste management plan for the County.

2.0 ENVIRONMENTAL SETTING

2.0 ENVIRONMENTAL SETTING

2.1 PLANNING AREA DESCRIPTION

An understanding of the physical and human geographic setting in the County is essential as a foundation for the long-term planning efforts the County is undertaking. The important issues, concerns, and problems associated with solid waste management must be fully understood before viable and practical solutions can be developed. To this end, this chapter describes the geography of the planning area, current solid waste generation quantities and characteristics, existing waste collection practices, recycling practices, solid waste management facilities, solid waste collection and disposal costs, and the prevailing legal environment associated with solid waste management.

This section describes the geographic and demographic aspects of the planning area for the Ulster County Solid Waste Management Plan. Included in the overall description are discussions relating to geology, soils and topography, water resources, air resources, terrestrial and aquatic ecology, cultural, historical and archaeological resources, demography, land use and zoning, community services, transportation, noise, and protected natural resource areas. By providing a baseline Countywide description, unique characteristics found in Ulster County can be considered in the development of the Plan. Subsequent site and technology specific environmental impact studies that must be prepared will provide a more detailed description of the environmental setting of any recommended site for a solid waste management facility.

2.1.1 ENVIRONMENTAL SETTING

Two physiographic provinces, the Valley and Ridge provinces, and the Appalachian Plateau dominate the geology and topography of Ulster County. This terrain, in which streams have eroded steep valleys to create the Catskill Mountains, has resulted in the concentration of residential and commercial development in the valleys with a radial pattern of highways extending from the County seat in Kingston.

Ulster is a typical Catskill county in that it has few large, natural waterbodies. Reservoirs have been developed in many of the available watershed basins, however, to serve local communities as well as New York City. The largest supplies of ground water in the County are available from unconsolidated sand and gravel deposits. These glacial outwash and recent alluvial deposits generally occur in river valleys and are of relatively limited aerial extent.

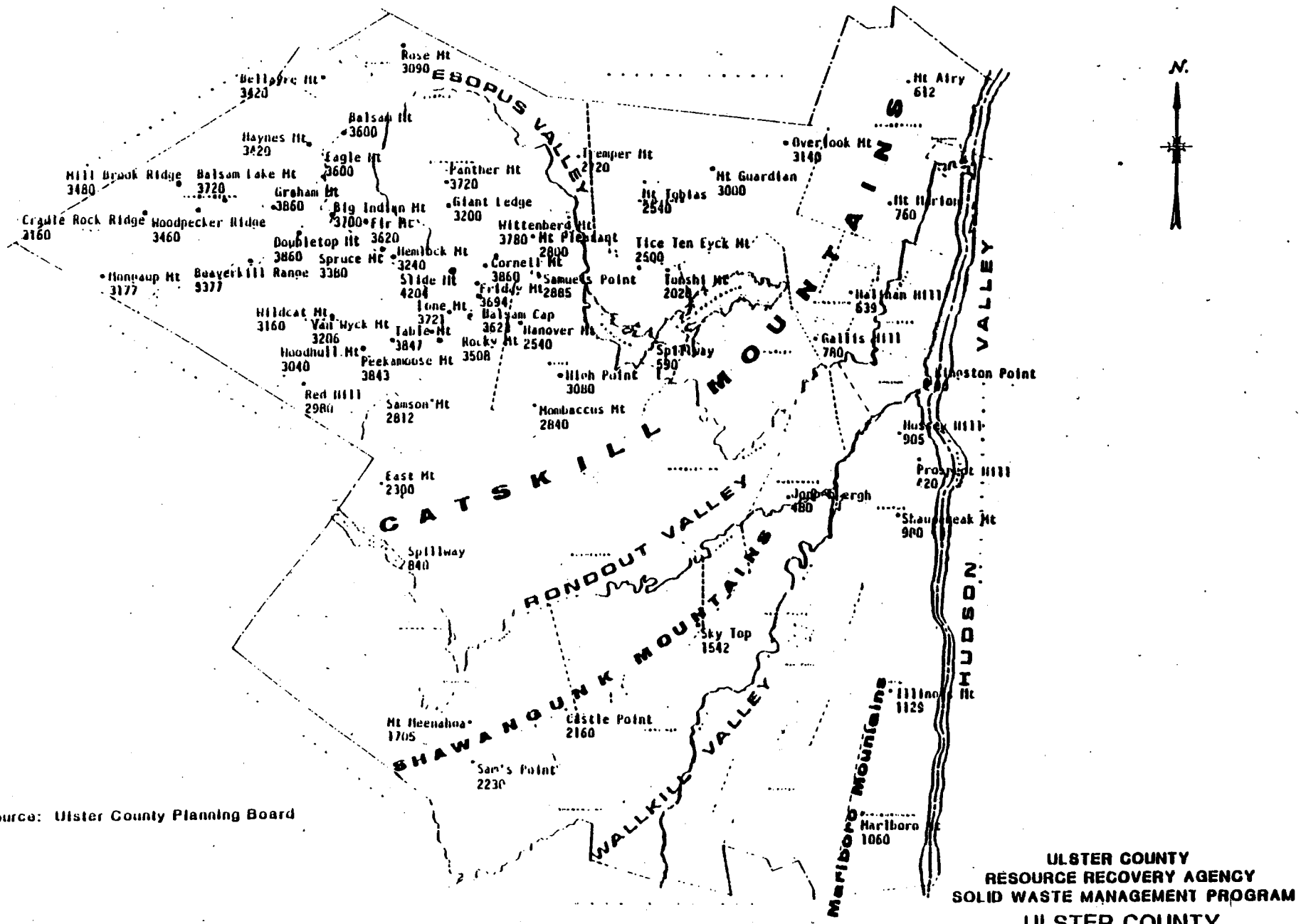
Most of the unconsolidated material which occurs in the County are ground moraines deposited by the wasting glaciers more than 15,000 years ago. These deposits vary in thickness and texture and form the base for the soils of the County. Glaciofluvial, glaciolacustrine, and ice contact deposits also occur locally and have been mined as sources of sand, gravel, and clay. (See Figures 2-1 and 2-2.)

Ninety percent of the County is overlain by soils at least 10 inches thick. The majority of the soils are well-to-excessively drained; although silt and clay-rich poorly drained soils cover about 5 percent of the County. These silt and clay-rich soils occur from the Orange County border to New Paltz and a one to two-mile strip running from Kingston to the Greene County border. (USDA, 1979)

There are many freshwater wetland habitats, with major wetland areas located in the eastern and southern part of the County. Ecological relationships are varied and extensive, as the Hudson River, Catskill Mountains, and large relatively undeveloped areas provide for a wide range of terrestrial and aquatic flora and fauna.

The County is located in the short summer, humid continental climatic region, modified locally by the Catskill and Shawangunk Mountains and the Hudson River. In terms of air quality, Ulster County is in the Hudson Valley Intrastate Air Quality Control Region, and currently is within regulatory limits for all criteria pollutants.

For additional information related to the Environmental Setting within the planning unit (Ulster County), the reader is referred to the DGEIS, Section 6.0 - Environmental Setting.

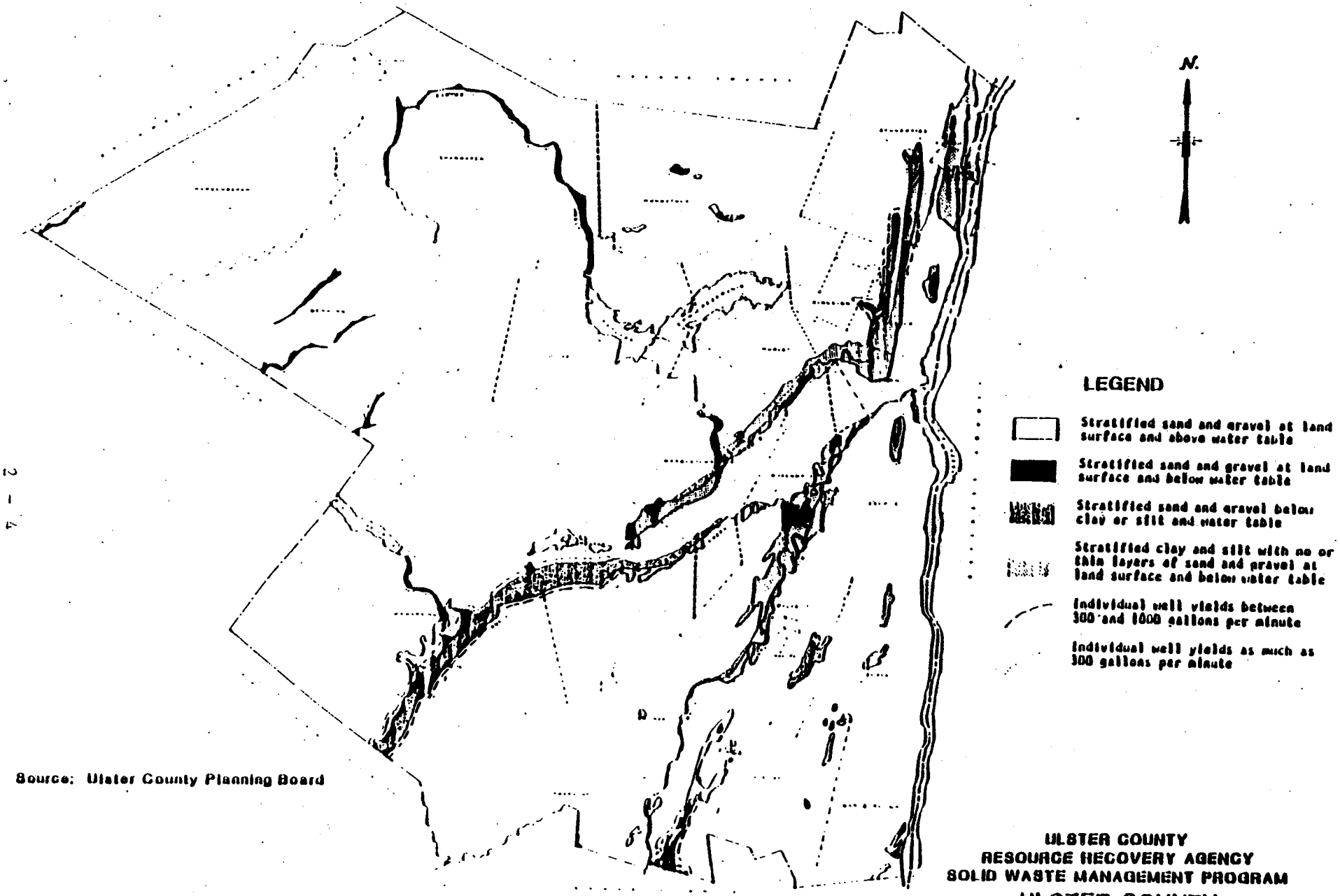


Source: Ulster County Planning Board

FIGURE 2-1

ULSTER COUNTY
RESOURCE RECOVERY AGENCY
SOLID WASTE MANAGEMENT PROGRAM

ULSTER COUNTY
LANDFORM



Source: Ulster County Planning Board

FIGURE 2-2

ULSTER COUNTY
RESOURCE RECOVERY AGENCY
SOLID WASTE MANAGEMENT PROGRAM

ULSTER COUNTY
AQUIFER POTENTIAL

2.1.2 POPULATION

The County is considered rural in character with the majority of the population concentrated in its eastern half. The 1980 and estimated 2000 populations for the County are 158,158 and 178,283, respectively. Table 2-1 below presents the New York State Department of Commerce's (NYSDC) official population projection for Ulster County.

TABLE 2-1

Population Projections for Ulster County 1980 to 2010

Year	Population	
1980	158,158	(1)
1985	163,135	
1990	168,471	
1995	174,053	
2000	178,283	
2005	181,331	
2010	184,139	

Note: (1) US Census Data
Source: NYSDC Official Population Projections for New York State Counties: 1980-2010, 1985

The 2000 population projection represents a 12.8 percent increase over the 1980 statistics (US Bureau of the Census, 1980; and Ulster County Planning Board, 1988). The mid-Hudson region's growth pattern has been quite different from general trends in the United States as well as the State. The County's population changes have generally paralleled the region. For the first half of the twentieth century, the growth rate was less than the national average. Until 1950, the County had only small increases in population; however, during the 1950's the trend changed with the County's rate of 28 percent increase exceeding the region. This trend continued into the 1960's with rates much higher than the nation or the state. The County ranked 19th of 62 counties in the State in 1980 with total population of 0.9 percent of the total (i.e., 158 thousand out of 17 million). The County is the 14th fastest growing county in the State and ranks third in total population in the mid-Hudson region. Table 2-2 presents the annual estimated population projections for Ulster County from the year 1985-2014, which constitutes the Solid Waste Management Planning period.

TABLE 2-2

ANNUAL ESTIMATED POPULATION PROJECTIONS FOR ULSTER COUNTY 1985 - 2014

Year	Population	Year	Population
1985	163,000	2001	179,000
1986	164,000	2002	179,000
1987	165,000	2003	180,000
1988	166,000	2004	181,000
1989	167,000	2005	181,000
1990	168,000	2006	182,000
1991	170,000	2007	182,000
1992	171,000	2008	183,000
1993	172,000	2009	184,000
1994	173,000	2010	184,000
1995	174,000	2011	185,000
1996	175,000	2012	185,000
1997	176,000	2013	186,000
1998	177,000	2014	187,000
1999	177,000		
2000	178,000		

Note: Values are rounded to the nearest thousand, based on extrapolation of NYSDC Official Population Projections for New York State Counties: 1980 - 2010

For the waste stream quantification study, presented later in this chapter, it was necessary to estimate the 1988 population and project the 1990 population for the County. These population estimates were also used to develop waste centroid data which is part of the siting evaluation (see DGEIS, Appendix F). In addition, the data was used to prepare the Transportation/Economic Analysis found in Section 3.0 - Transportation Study of the Supplemental DGEIS. Table 2-3 presents the estimated 1988 population for each municipality within the County. It also presents and provides a projected population for the year 1990.

For additional details regarding the methods used in arriving at population projections and how these projections were used in developing the "Plan", the reader is referred to:

DGEIS, Volume I, Section 4.2 - Population Estimates and Projections

TABLE 2-3

POPULATION PROJECTIONS BY MUNICIPALITY

Municipality*	1980 Census Data	1988*** Est. Population	1990** Projected Population	Average Annual % Change
Denning	474	530	550	1.50
Esopus	7,605	8,350	8,550	1.18
Gardiner	3,552	4,020	4,150	1.57
Hardenburgh	280	300	300	.69
Hurley	5,992	7,430	7,430	.77
Kingston (C)	24,481	23,810	23,650	-.34
Kingston (T)	924	940	950	.28
Lloyd	7,875	8,650	8,850	1.17
Marbletown	4,956	5,500	5,650	1.32
Marlborough	7,055	7,490	7,600	.75
New Paltz	10,183	10,830	11,000	.77
Olive	3,924	4,180	4,250	.80
Plattekill	7,409	7,920	8,050	.83
Rochester	5,344	5,780	5,900	.99
Rosendale	5,933	6,110	6,150	.36
Saugerties	17,975	18,710	18,900	.50
Shandaken	2,912	3,060	3,100	.63
Shawangunk	8,186	9,570	9,950	1.97
Ulster	12,319	12,860	13,000	.54
Wawarsing	12,958	13,190	13,250	.22
Woodstock	6,823	7,040	7,100	.40
	158,158	166,270	168,450	.63

Notes: (*) Village figures are included in Town totals.
(**) Rounded to nearest 50 persons
(***) Rounded to nearest 10 persons

Source: Ulster County Planning Board Data Book Update, 1988
1980 Data is based on US Census
1990 Projections are based on UC Planning Board data

2.1.3 TRANSPORTATION

Generally, the development of the County's road network and transportation systems traverse the valleys between ridges and mountains. The major corridors, including the Hudson River Valley, the Wallkill Valley, the Rondout-Lower Esopus Valley, and the Upper Esopus all radiate from the City of Kingston, making the Kingston area the most accessible in the County. See Figure 2-3. It is within these corridors that most land development has occurred and where prime transportation routes grew.

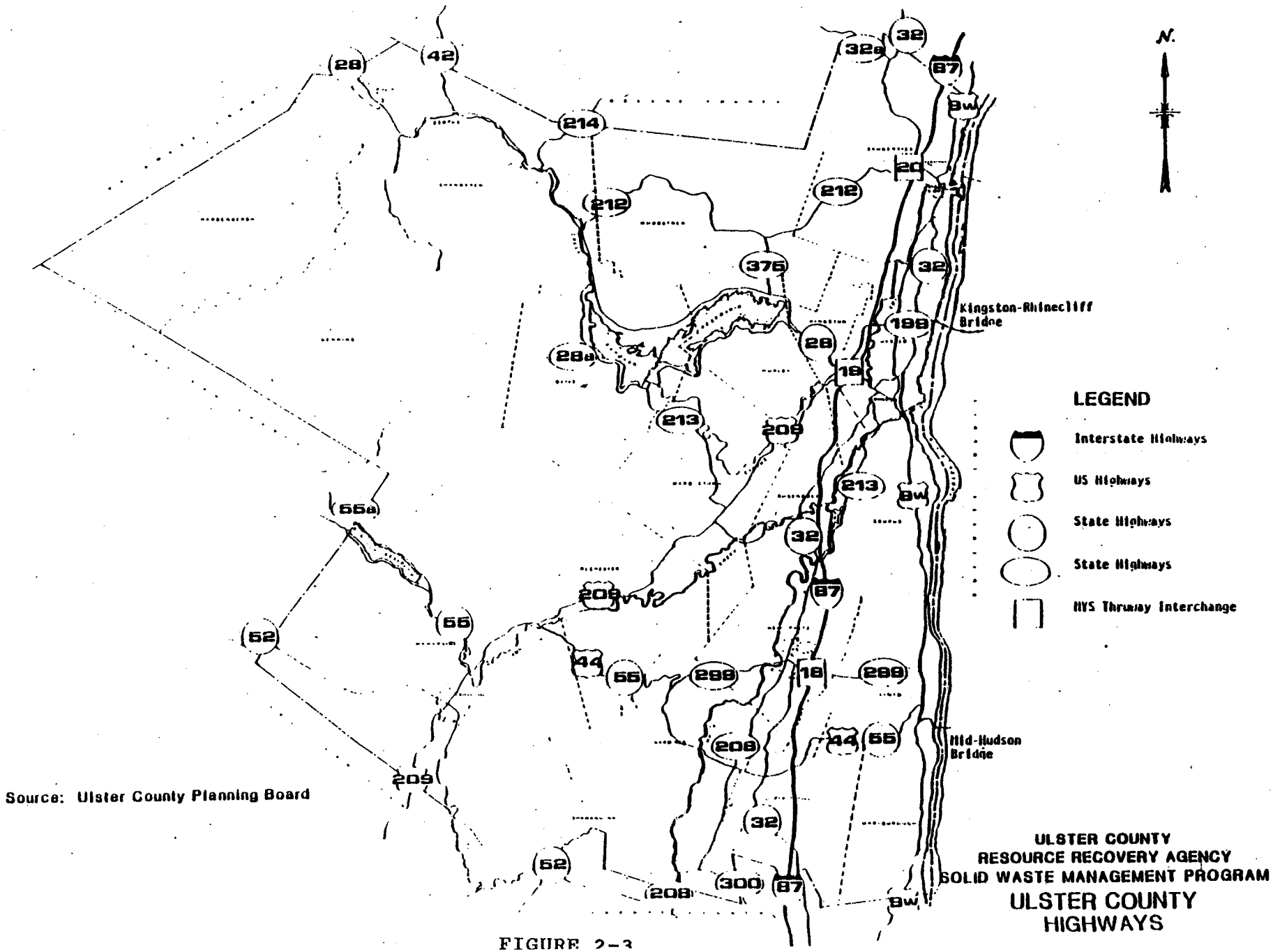
The mountains and ridges represent a formidable barrier between these corridors. Transportation routes connecting these corridors are limited, and roads that cross the Shawangunk Mountains are circuitous, mountain roads. Thus, accessibility to the western, sparsely populated portions of the County is relatively poor with respect to the eastern transportation corridors.

The New York State Thruway runs north and south through the County for almost 40 miles, the entire length of the County. The Thruway is a limited access highway with three interchanges located at New Paltz, Kingston, and Saugerties.

2.2 EXISTING SOLID WASTES COLLECTION AND DISPOSAL PRACTICES

An overview of existing solid waste management practices, including landfilling, recycling, and composting activities, used in Ulster County is provided in the following discussion of collection and disposal practices. For a detailed discussion of background data related to solid waste management and recycling collection and disposal practices, the reader is referred to the following:

a) DGEIS, Volume I, Sections 2.2 - 2.3
b) DGEIS, Volume I, Appendix C - UC Landfill Profiles
c) DGEIS, Volume I, Appendix D - Solid Waste Stream Analysis
d) DGEIS, Volume IV (RAP), Section 2.4 - Municipal Recycling Programs
e) DGEIS, Volume IV (RAP), Appendix A - Haulers Servicing UC
f) DGEIS, Volume IV (RAP), Appendix B - Existing Disposal Locations
g) DGEIS, Volume IV (RAP), Appendix D - Survey of Selected Recycling Programs
h) S-DGEIS, Section IV - Review of Existing Landfills



Source: Ulster County Planning Board

FIGURE 2-3

2.2.1 COLLECTION PRACTICES

Residential, commercial, and industrial waste collection services are primarily provided throughout the County by the private sector. The City of Kingston is the only municipality that provides municipal garbage collection, but for residences only. Municipal Recycling collection in the City of Kingston is also provided to residences as well as limited portions of the commercial sector. Private haulers provide collection service to the remaining commercial, industrial, and residential facilities. Table 2-4 lists the hauler servicing the various municipalities in Ulster County. This listing is current until May 1988. In most towns, private haulers contract directly with individuals rather than the municipalities. All villages and towns require haulers to obtain permits for collection. In addition, approximately 20 percent of all waste is delivered to landfills by residents.

2.2.2 DISPOSAL PRACTICES

As previously indicated, landfilling represents the primary solid waste disposal method presently used in the County. As of December 1988, municipalities without landfills indicated that the private haulers and/or municipal collection serving their community were disposing of their waste at the following locations:

Municipality	Disposal Site
Town of Denning	Sullivan County
Village of Ellenville	Wawarsing Landfill
Town of Hardenburgh	Delaware County
City of Kingston	Al Turi Landfill
Town of Kingston	Town of Ulster Landfill
Town of Marbletown	Private Haulers
Village of New Paltz	New Paltz Landfill
Town of Shandaken	Woodstock Landfill
Village of Saugerties	Saugerties Landfill

TABLE 2-4
HAULERS SERVICING ULSTER COUNTY
(AS OF MAY 1988)

	HAULERS 1988	1990 -1991
DENNING	NOT IDENTIFIED	ROSENCRANSE CORP.
ESOPUS	WESLEY T. HAYES	ULSTER CO. SANIT.
GARDINER	ARDONIA REFUSE SERV.	ARDONIA REFUSE SERV. / INDEPENDENT REFUSE SERV. / ROYS SANIT. SERV.
HARDENBURGH	ROSENCRANSE CORP. / HUBBLE BROS.	M & M SANIT. / BROOKSIDE DISPOSAL
HURLEY	ART SPERL & SON	ART SPERL & SON / ULSTER CO. SANIT.
KINGSTON(C)	MUNICIPAL COLLECTION	MUNICIPAL COLLECTION
KINGSTON(T)	RYAN SANIT. / DV SANIT.	ULSTER CO. SANIT.
LLOYD	PETE`S SANIT. / ROBISON`S REFUSE SERV.	TOP JOB SANIT. / MILTON SANIT. / ROBISON`S - REFUSE SERV. / MID HUDSON SANIT.
MARBLETOWN	ULSTER CO. SANIT.	ULSTER CO. SANIT.
MARLBOROUGH	ROBISON`S REFUSE SERV. / LAMELA`S SANIT. / GEORGE - GRAZIOSI	DPD ENTERPRISES / LAMELA`S SANIT. SERV. / GEORGE GRAZIOSI / MILTON SANIT.
NEW PALTZ	ARDONIA REFUSE SERV. / LAMELA'S SANIT. / ROBISON'S REFUSE SERV.	ARDONIA REFUSE SERV. / RYAN SANIT. / ULSTER CO. SANIT. / ROBISON`S REFUSE SERV. / ALLWASTE / LAMELA`S SANIT.
OLIVE	ULSTER CO. SANIT.	ULSTER CO. SANIT. / OLIVE CARTING & RECYL. / ROBISON`S REFUSE SERV.
PLATTEKILL	PETE`S SANIT. / ARDONIA REFUSE SERV.	ARDONIA REFUSE SERV. / DPD ENTERPRISES
ROCHESTER	ACCORD SANIT. / PRICE RITE SANIT.	ACCORD SANIT. / PRICE RITE SANIT. / ULSTER CO. SANIT.
ROSENDALE	ROBISON`S REFUSE SERV. / LAMELA`S - SANIT. / GEORGE GRAZIOSI	ULSTER CO. SANIT.
SAUGERTIES	ART SPERL & SON / AL SPERL / ULSTER CO. - SANIT. / WINFORD HARVEY / RODAK RELIABLE SANIT. SERV.	ART SPERL & SON / AL SPERL / ULSTER CO. SANIT. / RODAK - RELIABLE SANIT.
SHANDAKEN	LARRY JOYCE SANIT.	ULSTER CO. SANIT. / OLIVE CARTING & RECYCL.
SHAWANGUNK	ARDONIA REFUSE SERV.	ARDONIA REFUSE SERV. / ROY`S SANIT. / INDEPENDENT REFUSE SERV. / ORANGE CO. SANIT.
ULSTER	LAMELA`S SANIT. / ART SPERL & SON / ULSTER CO. SANIT. / RYAN SANIT. / RODAK - RELIABLE SANIT. / BERZAL EQUIPMENT (IBM)	LAMELA`S SANIT. / ART SPERL & SON / TOP JOB SANIT. ULSTER CO. SANIT. / RYAN SANIT. / ROSE OFFICE - CLEANING & RECYCL. / ULSTER CO. ROLLOFF / RODAK - RELIABLE SANIT. / ALLWASTE
WARWARSING	ULSTER CO. SANIT. / HENRY WRIGHT / COACH - MAN CARTING / BILL`S GARBAGE REMOVAL	ULSTER CO. SANIT. / HENRY WRIGHT / DPD ENTERPRISE ULSTER CO. ROLLOFF / JOE TIBBS
WOODSTOCK	ART SPERL & SON / DICK BENOIT REFUSE / WOODSTOCK SANIT. / LARRY JOYCE SANIT..	ART SPERL & SON / ULSTER CO. SANIT. / OVERLOOK - RECYCL. CORP. / ULSTER CO. ROLLOFF / OLIVE CARTING & RECYCL.

In addition to the 15 municipal landfills operating within the County, the City of Kingston operates a transfer station.

To assess operating practices as well as the status of the municipal landfills in County, field visits to these landfills were conducted in May 1988. As presented in Table 2-5, a brief profile of each landfill has been developed based upon the information obtained during these visits and information provided by the Ulster County Department of Health (UCDOH). A detailed profile can be found in the DGEIS, Volume IV (RAP), Appendix B. Figure 2-4 points out the general location of existing municipal landfills within the County.

Each of the 15 landfills in the County has entered into a consent order with the NYSDEC. These existing municipal landfills have been operating for many years, and as a result none of the landfills meet the stringent standards established in the Part 360 regulations which became effective December 31, 1988 (ie. liner systems, monitoring systems, etc.). In an effort to meet consent order requirements, many of the landfills have already installed monitoring wells, or plan to have them installed in the near future. For an identification of municipally owned waste disposal facilities used in the past but discontinued, the reader is referred to DGEIS, Volume I, Sections 2.3 and 4.3.1.

Based on information obtained during the landfill visits, characteristics of the municipal landfills in the County (such as age and size) vary greatly. Of the 15 landfills in the County, 3 have been in operation for 15 years or less, 9 have been operating between 15 and 30 years, and 2 have been in operation for approximately 40 years.

Of the 15 landfills, 4 sites are located on less than 25 acres, 6 on 25 to 75 acres, 4 on 75 to 100 acres, and 1 on 150 acres. The actual fill area (also referred to as the footprint) at 12 of the landfills ranges from 2.5 to 20 acres, while one footprint measures 33 acres. Data pertaining to the size of the footprint area was not available for two of the sites.

Operating practices at the municipal landfills in the County also vary. For example, approximately one-half of the landfills obtain cover materials from off-site locations, with many of the municipalities retaining private contractors to provide the cover materials. The remaining landfills utilize on-site cover materials.

Wastes that are delivered to the landfill sites are hauled by private carters and self-hauled by residents.

TABLE 2-5

MUNICIPAL LANDFILL SUMMARY

Town	Date of Operation	Site Size Total (acres)	Site Size Footprint (acres)	Types of (1) Waste	Remaining Site Life Years (4)
Esopus	1968	35	11	R,C,I,T,O,CD,LY,WG	7
Gardiner	1951	98	4	R,C,T,CD,LY,WG	NA
Hurley	1940	12	9	R,C,LY,WG	0
Lloyd	1966	82	7	R,C,I,T,CD,LY,WG	5
Marlborough	1972	83	4.5	R,C,I,T,CD,S,LY,WG,P	7
New Paltz	1969	151	20	R,C,I,CD,S,LY,WG,P	5
Olive	1950	18	5	R,C,CD,S,LY,WG	2
Plattekill	1958	40	NA (3)	R,C,CD,S,LY,A,WG	1
Rochester	1974	65	9.5	R,C,LY,CD,WG	27
Rosendale	1948	12	NA	R,C,I,T,CD,WG	0
Saugerties	1969	40	11	R,C,I,T,S,CD,LY,WG	1
Shawangunk	1975	25	2.5	R,C,I,S,O,CD,LY	7
Ulster	1955	46	33	R,C,I,CD,S,LY	9
Wawarsing	1974	60	5-8	R,C,I,T,S,CD,WG	7
Woodstock	1968	76	20	R,C,T,CD,LY,P,WG,A	46

Notes: (1) Key to Waste Types:

A	Automobile	O	Offal
C	Commercial	P	Pomace
CD	Construction & Demolition Debris	R	Residential
		S	Sewage Sludge
I	Industrial	T	Tires
LY	Leaf & Yard Waste	WG	White Goods

(3) NA - Not Available

(4) Where Will the Garbage Go? A Report from: New York State Legislative Commission on Solid Waste, Update, July 12, 1988.

Source: Vehicle County Program, 1988; Ulster County Landfills Videotape, 1988; Landfill Visits, 1988

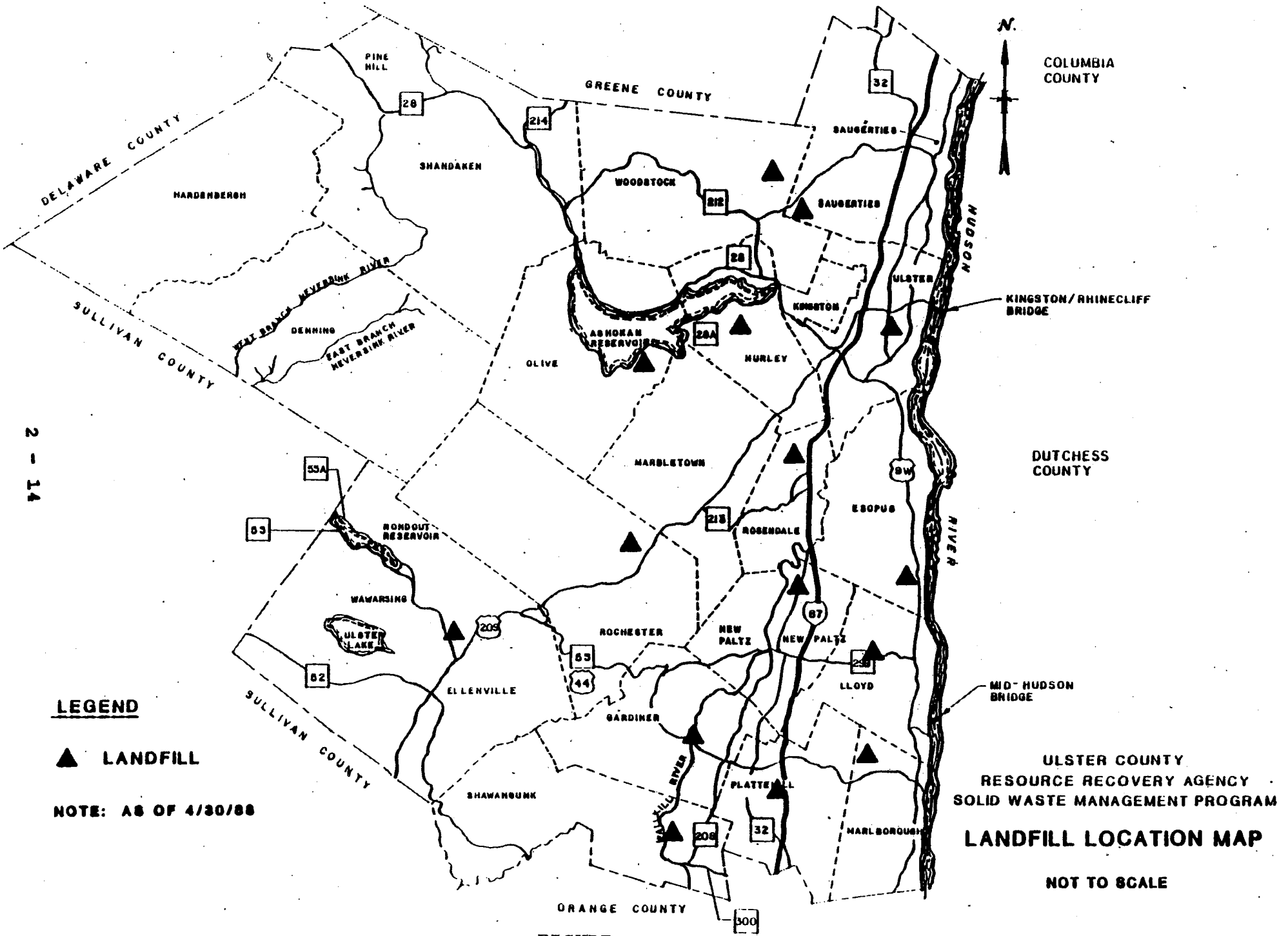

N.
COLUMBIA COUNTY
DUTCHESS COUNTY
ULSTER COUNTY
GREENE COUNTY
DELAWARE COUNTY
SULLIVAN COUNTY
SULLIVAN COUNTY
ORANGE COUNTY
PINE HILL
HARDENBERGH
SHANDAKEN
WOODSTOCK
SAUGERTIES
SAUGERTIES
DENNING
WEST BRANCH NEVERSINK RIVER
EAST BRANCH NEVERSINK RIVER
OLIVE
ASHOKAN RESERVOIR
HURLEY
KINGSTON
ULSTER
KINGSTON/RHINECLIFF BRIDGE
HUDSON
MARBLETOWN
ESOPUS
ROSENDALE
RONDOUT RESERVOIR
WAWARSING
ULSTER LAKE
ELLENVILLE
ROCHESTER
NEW PALTZ
NEW PALTZ
LLOYD
MID-HUDSON BRIDGE
GARDINER
SHAWANGUNK
WALLKILL RIVER
PLATTEKILL
MARLBOROUGH
28
214
32
212
28
28A
55A
63
213
9W
87
209
63
44
52
209
32
300
LEGEND
LANDFILL
NOTE: AS OF 4/30/88
ULSTER COUNTY
RESOURCE RECOVERY AGENCY
SOLID WASTE MANAGEMENT PROGRAM
LANDFILL LOCATION MAP
NOT TO SCALE

FIGURE 4

The level of activity associated with residents who self-haul can vary widely from municipality to municipality, but typically a landfill will experience from 100 to 300 self-haul vehicles per week. As of May 1988, 6 towns were issuing landfill permits to residents. According to local officials, four of these towns were charging $15 or less and two towns were issuing the permits free of charge.

Although the scope of recycling programs throughout the County has changed dramatically, at the time of the landfill visits in May, 1988, many of the landfills provided separate collection areas for recycling of newspaper, glass bottles, aluminum cans, and scrap metal. In addition, some of the landfills stockpiled tires and construction and demolition (C&D) debris in separate areas, and some of the landfills burned wood. Today, each of the landfills have well-developed, active Municipal Recycling Drop-off Sites associated with them. A detailed assessment of Existing (1990) Municipal Recycling Practices can be found in Section 2.3 of this document.

All sites accept commercial and residential waste. In addition, as of May 1988, the following materials generally were accepted at the municipal landfills in the County: Industrial non-chemical waste, tires, leaf and yard wastes, white goods (ie. washing machines and stoves), and construction and demolition (C&D) debris. The following wastes generally were not accepted: Waste oil, offal, pomace (except at several landfills as cover material), and toxic and hazardous waste.

2.3 EXISTING RECYCLING PRACTICES & FACILITIES

2.3.1 HISTORICAL

Early recycling efforts in Ulster County, started in the 1970's as part of the original Earth Day celebration, and were primarily voluntary programs staffed by community volunteers. Enthusiasm, usually high at first, gradually faded. Markets, actively seeking materials, would provide storage trailers, transportation or both.

The Ulster County Environmental Task Force held countywide newspaper, glass, and aluminum collections between the fall of 1970 and 1973. The last drive netted 100 tons of newspaper, 80 tons of glass, and 2,000 pounds or one ton of aluminum cans. The Ulster Association of Retarded Citizens (UARC) recycling program followed the Task Force efforts and continued for several years at their facility on Jansen Avenue.

Municipal efforts during this period included programs in the Towns of Marlborough, Marbletown, New Paltz, Olive, Rosendale, Saugerties, Wawarsing, and Woodstock. By 1987, New Paltz and Marbletown were collecting various grades of paper in paper trailers provided by local markets and color-separated glass in segmented roll-off containers. Rosendale was collecting only newspaper in a donated stationary (not roadworthy) trailer, from which the paper was manually reloaded by the Boy Scouts on to a town Highway Department truck and transported to market in Poughkeepsie. Wawarsing and other municipal programs had closed. Intermittent paper drives and aluminum can collections sponsored by schools, Scouts, the League of Women Voters, senior citizens groups, and other community organizations supplemented these efforts.

Concurrent with the passage of the Solid Waste Management Act of 1988, municipal efforts intensified. In January of 1988, the Town of Rosendale, with its landfill at 90% capacity, established by Town Resolution a policy mandating that recycling of source-separated newspaper, glass (further separated by color), and tin or aluminum cans occur at both the Town recycling drop-off site and at curbside. HDPE plastics were added in April 1988. New Paltz passed a similar resolution in June, 1988, as did Olive in June, 1989. Many other expanded municipal recycling efforts followed; utilizing equipment ranging from 55-gallon drums to rented trailers and roll-off containers. Hauling was either contracted or supplied by the municipality.

The City of Kingston initiated its comprehensive recycling program in 1988. The City started with the collection of corrugated cardboard, a major component of the waste stream generated by Kingston's large commercial sector. The City already provides municipal collection of mixed waste from the residential sector and began providing collection of recyclables from all sectors: residential, commercial, institutional, and industrial. Like the towns, they phased in their collection efforts as well: cardboard (April, 1988); newspaper, magazines, and yard wastes (May 1988); and metal cans (January, 1989). Glass and plastics were added in September 1989, and an office paper pilot collection program from businesses was included in 1990. White goods and scrap metal had, for many years, been collected separately and recycled through local scrap dealers.

Two municipalities passed local mandatory recycling ordinances in 1989: Wawarsing in October and Rosendale in December. Although both ordinances specify local enforcement mechanisms, neither town is actively implementing these measures as of yet.

Table 2-6 below summarizes the status of Existing Municipal Recycling programs as of February 1991. For additional details relating to the past municipal efforts in recycling, the reader is referred to the DGEIS, Volume IV (RAP), Section 2.4.

2.3.2 UCRRA RECYCLING DEVELOPMENT PROJECTS (1988 - 90)

In October 1988, UCRRA initiated Recycling Development Projects designed to increase the amount of materials that were being recycled and to begin to form partnership arrangements between Ulster municipalities and the UCRRA. A detailed description of the history of the project and its purpose can be found in the DGEIS, Volume IV (RAP), Section 9.0.

Since October, 1988, newspaper has been collected at municipal recycling drop-off sites (MRDS), usually located at the Town Landfill, from both residents and commercial haulers. Originally, roll-off containers were provided by Ulster County Sanitation, Inc. under contract with the UCRRA. Later, August 1990, the rented roll-offs were replaced by the Agency owned equipment. The newspaper was transported to Thruway Paper in Suffern, a subsidiary of Garden State Paper. The Agency was paid $5.00/ton for the first 8 months of the newspaper development project and then charged $35.00/ton for the next 13 months. In February of 1991, the Agency began receiving $25.00/ton. Transportation and processing was provided by the hauler and all costs were paid by the Agency. This project totalled 3,130 tons of newspaper and helped the Agency gain direct experience and knowledge of hauling, processing, and marketing of recyclables. This experience was most beneficial and was applied in establishing the Countywide Satellite Aggregation Center System that replaced the development projects.

A separate recycling development project involved the collection of commingled newspaper, glass bottles, and metal cans in the Town of Ulster. All singe-family residences having curbside collection were provided with 14-gallon household collection containers for recyclables. Ulster County Sanitation, Inc. provided pick-up services. In addition, two roll-off containers were placed at the Town landfill (one for newspaper and one for commingled materials), giving the Town's residential self-haulers the opportunity to recycle as well. During the course of the project, it was decided to place separate roll-offs at the landfill, one for each material being recycled. This gave the self-haulers the responsibility of source separating the materials.

TABLE 2-6

ULSTER COUNTY RESOURCE RECOVERY AGENCY

LIST OF MUNICIPAL RECYCLING CENTERS

(As of April, 1991)

Municipality	Location	Hours of Operation	Recycling Contact	Materials Currently Recycled*
1. Denning	Drop-off Site	To be Determined	Mike Larison 985-2291 (w)	N/A
2. Esopus (d,c)	Off Floyd Ackert Rd, 1/4 mile west	Daily 8-3 Closed Wed. & Sun.	Barbara Patrick 384-6439	Newsprint, glass, metal cans, plastic (inc. PVC), Cardbd., compost, scrap metal and tires.
3. Gardiner (d)	Stevens La.,off Dusinberre Rd. near Rt. 44/55	9-5pm M/W/Sat 10-2pm Sun.	Curt Dankelman 225-3641 (w) 255-9675 338-3292 (h)	Newsprint, glass, metal cans, cardbd., office paper, auto batteries, plastic (inc. PVC & PP) tires, white goods.
4. Hardenburgh (d)	UC Hwy. Substation River Hollow Rd	1st & 3rd Sat of month	Cheryl Michalski 439-3372	Newsprint
5. Hurley (d,c)	Dug Hill Rd., West of Kingston East of Ashokan Reservoir	Mon. 8-4pm T,Th,F 9-4pm Sat 9-3pm Closed W,& Sun	James Craven 338-5412	Newsprint, mags.,cardbd., junk mail, glass, plastic, metal cans., styrofoam, alum. & scrap metal, auto batteries, tires, waste oil, paint, compost
6. Kingston (c) (d,c)	Transfer Station	Municipal Trucks only	Jay Hogan 331-0682	Newsprint, cardbd.,glass, metal cans, plastic, office & computer scrap metal, compost
7. Kingston (t) (d,c)	Town Hall Sawkill Rd.	Newsprint anytime curbside 3rd Fri.	Debra Sylvester 336-4675 (h) Anna Mellin 336-8795 (h)	Newsprint, cardbd., glass anytime
8. Lloyd (d)	Town Landfill Lily Lake Rd.	T,Th,Sat 9-4pm Sun. 9-1pm M, W, F 9-3pm	Tom Ryan 691-8066	Newsprint, scrap metal, motor auto batteries, tires, glass, plastic, metal cans, aluminum, and compost
10. Marbletown (d,c)	Canal Rd. High Falls	Th,F 12-4pm Sat 8-4pm	Louis Gross 687-4649	Newsprint, cardbd., office & computer paper, glass, metal cans, plastic, scrap metal, auto batteries and compost
11. Marlborough (d)	Town Landfill Bailey Gap Rd. Milton 795-2341	W,F,Sat 8:30-4:45pm Sun 8:30-11:45am closed M,T,Th	Vince Porcelli 236-7829 Rocco Carfano 236-4605 (h)	Newsprint, glass, scrap metal,tires,compost
12. New Paltz (d,c,m)	Clearwater Rd off Rt 32N (3 mi. north of Village)	Daily 9-5pm (incl. Sat & Sun) closed W, Th	Kathy Dundorf 255-3749 Marko Cynamon 255-5050	Newsprint, cardbd., mags., office & computer paper, glass, metal cans, plastic, alum., compost, tires, waste oil, scrap metal, auto batteries, junk mail, brown bags

TABLE 2-6 (con't)

Municipality	Location	Hours of Operation	Recycling Contact	Materials Currently Recycled*
13. Olive (d,c,m)	Landfill at Brown Sta. & Beaverkill Rd.	M,W,F,Sat 8:30-4:30pm Sun.1-4:30pm	Chuck Davis 657-8177	Newsprint, glass, metal cans, alum., magazines, plastic, tires, motor oil, auto batteries, scrap metal, compost office & computer paper
14. Plattekill (d,c,m)	Landfill on Freetown Rd	M,T,W,F,Sat. 9-5pm (closed 12-1) Sun 9-12pm	Chuck Entress 883-6701	Newsprint, cardbd., glass, metal cans, office & computer paper, plastic, tires, auto batteries, compost junk mail, mags.
15. Rochester (d)	Airport Rd., 1 mi. west off Rt. 209	Daily 8-4pm closed Th, Sun. Wed 8-5PM	Bob Baker Councilman 626-0052	Newsprint, glass, metal cans, HDPE & PETE deposit bottles only, scrap metal, auto batteries, and tires
16. Rosendale (d,c,m)	Whiteport Rd.	M, Th, Sat. 9-5pm	Renee Lohre 658-3159 (Town Hall) 338-0113 (Landfill)	Newsprint, glass, metal cans, plastic, compost, tires, auto batteries, scrap metal
17. Saugerties (d,c)	Rt. 212, 1 mi. West of Glasco Turnpike	Mon.-Sat. 7-3pm	Jill Gruber 246-0058 Landfill 246-9866	Newsprint, mags., cardbd., office & computer paper, brown bags, phone books junk mail, glass, metal cans, plastic, alum. & scrap metal, compost
18. Shandaken (d,c)	Town Hall, Rt.28 Use Woodstock for other materials until further notice		Eddie Bauer 688-5004	Newspaper (See Woodstock list)
19. Shawangunk	Landfill off River Rd., Walker Valley Schoolhouse - Wallkill, Rt.208 -	T,Th,F 8:30-4pm Wed. 9am-4:30pm 1st/3rd Sat 2nd/4th Sat 9am-1pm	Andrew Ghiorse 895-2611	Newsprint only at landfill, newsprint, cardbd., office & computer paper, glass, metal cans, alum., plastic (inc. styrene foam food service containers), auto batteries on bus only. Yard waste composting at Wallkill Corr. Facility
20. Ulster (d,c)	Landfill, Rt.9W behind Cinema 1-2-3	Daily 7-3pm Open Sunday 8-11:45am	Orvil Norman 382-1367 (h)	Newsprint, glass, metal cans, plastic, compost, scrap metal
21. Wawarsing (d,c,m)	Off Rt.209 4 mi. north of Ellenville	Mon.-Sat. 8-4pm	Bob Eck 647-6570	Newsprint, glass, metal cans, compost, alum. & scrap metal
22. Woodstock (d,c)	W. Saugerties Rd. 1/2 mi. north of Glasco Turnpike	Mon.-Sat. 8-4pm	William Reich 679-6570	Newsprint, cardbd., office & computer, paper, mags., brown bags, phone books, glass, plastic(inc. PP & PVC), metal cans, alum. & scrap metal, tires, motor oil, auto & household batteries, compost

* Plastic is HDPE & PETE unless otherwise specified

Since there was no market for commingled recyclables at that time, Ulster County Sanitation, Inc. retained the responsibility for separating the materials collected from the curbside pick-up. The Agency was charged $30.00/ton for collection, processing, transportation, and marketing. This project resulted in 120 tons of glass bottles and cans being recycled. The Agency gained insight into the advantage and disadvantage of source separation of recyclables both at the point of collection, curbside, and at municipal drop-off sites. This experience was also applied to the development of the Countywide Satellite Aggregation Center System that is presently in effect.

2.3.3 RECYCLING MATERIALS EXPANSION (1989-1991)

From 1989 - 1991, most municipalities began expanding their programs to include an increasingly wide range of recyclables. Presently, many are collecting up to 15 different materials including newspaper, cardboard, office and computer paper, magazines, phone books, junk mail, paper bags, color-separated glass bottles and jars, tin and/or aluminum metal cans, two or more types of plastic, aluminum scrap, white goods and other scrap metal, auto and batteries, tires, waste oil, and yard and brush for composting. One municipality is even collecting paint for reuse by local farmers.

2.3.4 MUNICIPAL RECYCLING DROP-OFF SITE (MRDS) DEVELOPMENT

As stated in 2.3.1, prior to 1988 recycling was occurring in Ulster County on a much smaller scale than it is at present. The Municipal Recycling Drop-Off Sites (MRDS) in existence at that time were extremely low-tech. In fact, much of the recycling done during those years was through a variety of drives and didn't require a dedicated location. Since 1988, however, Ulster County has seen the gradual development of Municipal Recycling Drop-Off Sites. With the passing of the Solid Waste Management Act, the institution of UCRRA and an increased awareness of the importance of recycling, many towns began to upgrade their programs. This process usually included some form of site development.

In 1988, the Town of New Paltz built the first bi-level Municipal Drop-Off Site with gabions. Since that time, the Towns of Ulster and Wawarsing have also built bi-level sites. The Towns of Olive and Hurley are currently under bi-level construction and many of the other towns

are planning to begin soon. All of the towns that are not currently complete or under construction have plans to upgrade their sites by May 1991 to comply with the terms of the Intermunicipal Agreements they have with UCRRA. These terms include:

- Accessibility to the public
- Accessibility to the haulers
- Ability to handle UCRRA roll-offs and other Agency equipment

These terms do no necessarily require the development of a bi-level sites, but each community that can not do so must develop a plan which can accommodate the public, the haulers, and the Agency in an alternative fashion. Site considerations also include developing surfaces that will be able to handle full roll-offs and heavy equipment, roads that will be accessible to all vehicles, working areas that will be available to access materials, roll-off sites that will insure ease of use for the public and private sector as well as the Agency, and that the entire site itself will be secure.

The MRDS are an integral part of the County's Satellite Aggregation Center (SAC) System. (See Section 9.3.3 of this document.) They constitute a major component of the primary stage in the County program. Their successful construction and operation is crucial to the proper functioning of the entire recycling plan.

2.3.5 CURBSIDE EXPANSION

During this period, Ulster County Sanitation, Inc. provided its customers with bi-weekly recycling collections in the Towns of Marbletown, Rosendale, Ulster in 1988; New Paltz, Olive, Esopus, Wawarsing in 1989; and Saugerties in 1990. Several other haulers were also beginning to provide curbside collection of recyclables. These included Robison Refuse and Ardonia Refuse in New Paltz, Olive Carting in Olive, Overlook Recycling in Woodstock, and Art Sperl in Saugerties and the Town of Ulster. The City of Kingston provides municipal collection of recyclables from residents and businesses and the Town of Kingston collects recyclables from residents. Several other municipalities are evaluating the economics of providing this service. The Agency has proposed that as a provision of Ulster County's mandatory recycling legislation, all commercial haulers who collect mixed waste in Ulster County be required to provide curbside recycling collection for both their residential and commercial/institutional customers.

2.3.6 RECYCLING PERSONNEL/EQUIPMENT

Recycling Personnel (Town/City) - For several years the only paid recycling staff person in Ulster County was Louis Gross, manager of the Marbletown Recycling Center, which opened in 1982 after the Marbletown landfill closed. In 1988, recognizing that volunteer time was limited; that recycling drop-off centers need to be supervised; and acknowledging the importance of education, many municipalities began to hire paid recycling coordinators and assistants. At present, there are thirteen paid Municipal Recycling Coordinators (MRCs) and most MRDS have at least one, and as many as three, dedicated recycling personnel. The City of Kingston's Department of Public Works collects, processes, transports, and markets its materials. All twenty-one municipalities in Ulster County have a person responsible for recycling, whether paid or volunteer, and all have formed or are forming recycling committees, often through their environmental commissions, or Solid Waste Management Boards.

Most municipal recycling programs began as low-tech operations with the towns utilizing whatever funding, labor, and equipment they could find. Presently, every municipality has some funding, staff, and equipment dedicated to recycling and composting. Some of the programs are still using volunteer MRCs rather than paid staff and many towns are using highway or landfill workers on an "as needed" basis rather than hiring dedicated recycling staff. Some of the programs get part or all of their funding from other budgets (usually landfill, highway, or general funds in a specific area such as personnel or equipment). Each municipality has placed a high priority on substantially developing their Municipal Recycling program.

Table 2-7a provides a summary of the funding available to the municipalities in 1991 as well as the existing staff support for each program.

Recycling Equipment (Town/City) - Regarding equipment use, what is presently occurring in Ulster County is the primary use of at least one piece of machinery such as a front end loader, a skid steer loader, or a backhoe (often with fork attachments) for recycling and composting. In recycling, this machinery is used to move materials, crush glass or flatten tin. In composting, this machinery is used to move materials and turn the compost piles. Many towns use 55 gallon drums, sheds and various trailers for the storage of materials, especially paper products. A few towns have motorized equipment for pick-up or delivery of materials and a few have compacting or baling capacity on a small scale. Seventeen of the towns have anywhere from 1 to 4 roll-off

Table 2-7a
1991 Recycling Budgets and Existing Staff for Municipal Programs in U.C.

Town	1991 Recycling Budget	Staff Support for Existing Programs
Denning	none	none
Esopus	$5,000 *	volunteer Municipal Recycling Coordinator(MRC) landfill worker-8-10 hours a week 2 gatekeepers-monitor landfill/recycling areas each day Superintendent or dozer operator-4 hours a week
Hardenburgh	none	volunteer MRC
Gardiner	$16,000	MRC-full-time landfill manager and equipment operator-as needed
Hurley	$37,300 *	landfill manager-20+ hours a week gate monitor-25% to Recycling and Composting assistant-40 hours a week Heavy Equipment Operator (HEO)-10 hours a month
Kingston(C)	none ** processing $206,155 * personnel $926,850 * all funding from DPW budget including above & any other costs	DPW Superintendent-30% * Asst. Superintendent-30% MRC-part-time, 100% Secretary-50% Clerk-30% 16 laborers--14-100%, 2-80% 9 drivers--7-100%.2-50% 2 foreman-100% 1 transfer station operator-80% 1 weigh master-80% ARC crew (sorting)-full-time, size of crew varies *all staff is full-time except MRC, percentages show time dedicated to Recycling and/or Composting
Kingston(T)	$3,300 *	2 Highway Department workers-20 hours a month each MRC and assistant-20 hours a month each 2 boys-part-time weekends at Recycling Area
Lloyd	$20,000 *	volunteer MRC 2 landfill workers-Recycling-5%,Composting-10%
Marbletown	$42,500	MRC-30 hours a week occassional use of alternate sentencing
Marlborough	$55,700 *	MRC-3-4 hours a week Landfill manager-40% to Recycling and Composting HEO-10% to Recycling and Composting 3 part-time attendants-20% monitoring Recycling

*some program costs from landfill, highway or general funds
**all recycling/composting costs under landfill budget or other

Table 2-7a (con't)

1991 Recycling Budgets and Existing Staff for Municipal Programs in U.C.

Town	1991 Recycling Budget	Staff Support for Existing Programs
New Paltz	$181,908	Landfill/Recycling Supervisor-75% Recycling MRC-32 hours a week 2 fulltime Recycling Center workers HEO-5 hours a week 2 Secretaries-1 @ 6 hours a week, 1 @ 8 hours a week Highway Superintendent-minimal
Olive	$31,065 *	MRC-36 hours a week
Plattekill	$52,615	MRC-16 hours a week 1 full-time worker 1 part-time worker-10 hours a week
Rochester	none **	volunteer MRC landfill foreman and HEO-25% Recycling and Composting other landfill worker-33% Recycling and Composting
Rosendale	$44,822 *	MRC-40+ hours a week Assistant-30 hours a week HEO-2 hours a week-Composting Landfilll manager-5-10 hours a week
Saugerties	$142,300 *	MRC-40 hours a week 3 workers(1 is spotter)-75% Recycling and Composting 3 gatekeepers-1 full-time,2 part-time-minimal each day landfill foreman-20% Recycling and Composting landfill manager-50% Recycling and Composting
Shandaken	none	volunteer MRC and Town worker-minimal
Shawangunk	$22,000	MRC-15 hours a week
Ulster	$50,000 *	volunteer MRC HEO-6 hours a week on Recycling and Composting landfilll workwr-10 hours a week
Wawarsing	none **	MRC-full-time (reevaluation of time need-Sept.'91) 1 full-time worker HEO and landfill manager-minimal Town Supervisor-4 hours a week Clerical-2 hours a week
Woodstock	$92,719	Landfill manager as MRC-80% Recycling and Composting 1 full-time worker-50% Recycling,25% Composting 1 full-time worker-100% Recycling

*some program costs from landfill, highway or general funds
**all recycling/composting costs under landfill budget or other

containers (20, 30, or 40 cubic yards) provided by the Agency under the terms of the Intermunicipal Agreements. These roll-offs are used as collection containers for source separated recyclables. They are also used in transporting the recyclables to market. Often laborers from the landfill or highway departments interface with recycling staff in the use of the various equipment and machinery.

Table 2-7b provides a summary of the equipment presently being used by each municipality for recycling and composting. Also an estimate of time of use for each is provided.

The UCRRA has also committed a vast amount of resources and equipment to the County's Recycling Program. To date, over $1 million has been spent on recycling equipment used in transporting recyclables from the MRDS to the SAC and ultimately to market. The County is being reimbursed for up to 50% of these expenditures by the NYSDEC under a Low Technology Resource Recovery (LTRR) Grant. UCRRA plans to expend even more resources in 1991-1993 to maximize recycling within the County. For a detailed discussion of these plans see Section 9.3.3.

2.3 7 COMMERCIAL/INSTITUTIONAL/INDUSTRIAL RECYCLING

COMMERCIAL/INDUSTRIAL

Many businesses throughout Ulster County are already recycling. Some have been recycling for several years because they found it to be a cost-effective business practice; others are preparing themselves to be in compliance with mandatory recycling. IBM, Central Hudson, Rotron, and KTB are among the major businesses in Ulster County that have made substantial efforts to reduce their waste stream by recycling. Several other businesses are acting as markets for a variety of recyclable materials. Table 2-8 lists and describes specific existing commercial, industrial, and institutional recycling programs that are operating in Ulster County . Table 2-9 lists existing Ulster County recycling businesses.

INSTITUTIONAL

The Solid Waste Management Act of 1988 mandated that state agencies have a recycling plan developed in July, 1989, and fully implemented by July, 1990. To meet this goal SUNY/New Paltz developed a comprehensive recycling plan which was adopted by its administration in 1989 and has been phased in over the past several years. Wallkill and Shawangunk correctional facilities also began recycling in 1989, followed by Eastern/Napanoch. Ulster County BOCES has been recycling cardboard and office paper. Other school recycling programs, in both offices and cafeterias, include the Wallkill, Ellenville,

Table 2-7b
Existing Municipal Recycling and Composting Equipment

Town	Existing Equipment Recycling	Existing Equipment Composting
Denning	none	none
Esopus	55 gallon drums 1/60' trailer 4 Agency roll-offs	bulldozer \ 16 hours front end loader/ a month
Hardenburgh	1/12 yard box for news	none
Gardiner	55 gallon drums 1/45' trailer 4 Agency roll-offs	none
Hurley	front end loader--4-5 hours a month 55 gallon drums 1 trailer 3 Agency roll-offs	front end loader--4-5 hours a month
Kingston(C)	2 Agency roll-offs-100% 3 tractors-50% 5/68 cu.yd. compactor trailers-80% 2 packers-100% 1/5 yd. dump truck 100% 2/ 1 1/2 yd. dump trucks-100% 3/15 yd. bin trailers-100% 2 pick-up trucks-100% 1 skid loader-100% 1 front end loader-100% 1 backhoe loader-100% 1 boom crane truck-20%	2+ packers-100% (all year) additional equipment used from Octobe to early winter: 2 leaf vacs 2 pick-ups with plows 2 sweepers 1 vac-all 4 dump trucks with leaf boxes
Kingston(T)	2/1 ton dump trucks with trailer--10-15 hours a month backhoe with forks-2 hours a month recycling shed 55 gallon drums	none
Lloyd	front end loader\ minimal dump truck / use 2 Agency roll-offs	front end loader-5 hours a week dump truck-3 hours a week
Marbletown	front end loader-minimal time use compactor(plastic & tin-2'x2'biscuit)-5 hours a week 2 trailers for paper 1/50 yard roll-off 2 Agency roll-offs	none

Table 2-7b (con't)

Existing Municipal Recycling and Composting Equipment

Town	Existing Equipment Recycling	Existing Equipment Composting
Marlborough	front end loader-5% time use backhoe-5% time use dump truck-5% time use storage shed 40 yard roll-off 2 Agency roll-offs	front end loader-5% time use dump truck-5% time use
New Paltz	skid steer loader--6-8 hrs.wk. 3/45' trailers 3 Agency roll-offs	bulldozer-3 hours a week
Olive	front end loader-4 hours week horizontal baler(plastic-16"x30"x30" bale)--not currently in use-was using 10 hours a week 55 gallon drums 4 Agency roll-offs	front end loader-minimal time use
Plattekill	1 small trailer 5 Agency roll-offs	bulldozer-1 hour a month
Rochester	front end loader--4-5 hours a week bulldozer--4-5 hours a week 3 Agency roll-offs	front end loader--4-5 hours a week bulldozer--4-5 hours a week
Rosendale	55 gallon drums 4 Agency roll-offs	front end loader-minimal time use
Saugerties	front end loader-minimal time use 3 trailers (2 town-owned,1 market-owned) 55 gallon drums 1 ton pick-up truck -100% for Recycling, 75% time use 4 roll-offs (hauler-owned) 10 wheeler dump truck-8 hours a week	front end loader-12 hours a week
Shandaken	1 Agency roll-off	none
Shawangunk	Recycling Bus--8-10 hours a week,4 weeks a month 55 gallon drums 1 Agency roll-off	at prison-bucket loader
Ulster	front end loader-4 hours a week 2 Agency roll-offs	front end loader-2 hours a week
Wawarsing	2 front end loaders-5 hours a month 4 Agency roll-offs	2 front end loaders-minimal time use

Table 2-7b (con't)

Existing Municipal Recycling and Composting Equipment

Town	Existing Equipment Recycling	Existing Equipment Composting
Woodstock	backhoe \ 6-10 hours front end loader with forks/ a week 1/45'trailer Scout-15 hours a week 55 gallon drums 1 ton dump truck-2 hours a week hand truck-minimal time use Highway Department tandem truck-4 hours a week 2 Agency roll-offs	backhoe \ 10 hours front end loader with forks/ a month

Table 2-8

PRELIMINARY SURVEY OF
1990 COMMERCIAL/INDUSTRIAL/INSTITUTIONAL RECYCLING

Note: This list was the result of a questionnaire/telephone survey conducted by the Agency Recycling Coordinator to municipal recycling coordinators in January - February, 1991. It is by no means comprehensive. Businesses and institutions will be required by Law to submit a "Commercial/Institutional Waste Reduction and Recycling Plan by September 1, 1992" as well as to report volumes of materials reduced, recycled, or composted on a regular (at least annual) basis. This will assure comprehensive monitoring of commercial/institution waste reduction and recycling efforts. Technical assistance and advise for areas of improvement will be provided by the Agency and municipal recycling coordinators.

DENNING:
- Frost Valley YMCA: recycling all IMA recyclables (newspaper, cardboard, office paper, glass, metal cans, HDPE and PETE plastic); also recycle batteries, waste oil and have built an innovative facility to do institutional-scale composting of food waste, yard waste and soiled paper.

ESOPUS:
- Ireco and several "Mom and Pop" businesses along 9W are recycling cardboard.
- Discussions initiated by municipal recycling coordinator with Iron Mountain Records Storage Facility re: cardboard.

GARDINER:
- Rivendale Winery recycling cardboard and glass.
- Virtis Manufacturing (scientific equipment): cardboard and office paper
- Wright's Farm: cardboard

HARDENBURGH:
- Beaverkill Valley Inn: purchasing recycling equipment; will start all IMA materials as soon as Turnwood MRDS is ready. Contact: Ms. Chris Dennis
- NY State DEC Park at Little Pond: glass, plastic, cans. Contact: Len Bouren

HURLEY:
- Ridge Liquor Store: cardboard
- Woodstock Chimes (Woodstock Percussion): cardboard

KINGSTON (CITY):
- City of Kingston Department of Public Works began municipal curbside cardboard collection in 1988. About 30 uptown businesses are also recycling office paper at curbside via muncipal collection by DPW; all businesses are in-serviced by Recycling Educator prior to DPW providing collection service to assure that office paper meets market specification. DPW markets material directly. Some facilities, mainly restaurants, are recycling container materials (glass, plastic and metal cans) at curbside as well.

City of Kingston (continued):
- City Hall is fully recycling all IMA materials
- Ulster County Office Building (UCRRA pilot project): generating 1 ton per month of clean office paper (file stock) and computer paper, under contract with National Recycling in Marlboro; also about 0.3 tpm of newspaper and cardboard via City of Kingston DPW.
- Several schools, both Benedictine and Kingston hospitals, the Ulster County Jail are recycling all IMA materials from offices and kitchens.
- Office paper and/or cardboard or container materials from: 291 Wall St. offices; Family of Woodstock; Fitness Unlimited; London's; Metropolitan Life; Mohican Market; N.E. Insurance; Omega Institute; Ponckonkie Congregational Church; Reis Insurance; Roland Augustine; Rusk, Wadlin, Hepner, & Martuscello; Samoff, Kaplan, Benton Fragman; Soft Data; Trailways; and WGHQ.

KINGSTON (TOWN): One liquor store (Trail Liquor) is recycling cardboard (taken to Hurley Recycling Center).

LLOYD:
- Central Hudson: has implemented a comprehensive program of reuse and recycling of office paper, various types of wire, glass globes from street lamps and assorted parts, wooden spools, and other equipment and materials. The company policy is to reclaim everything possible. Central Hudson has contracted with Ulster County Association for Retarded Citizens to employ a staff of over 25 workers in this materials recovery program. Central Hudson finds that this program is far more cost-effective than mixed waste disposal. Contact: Conrad Flickenschild (331-1510 x3301).
- Division for Youth: waiting for Town to complete MRDS site development. Contact: Margie Bell.
- Jamesway and Grand Union: recycling cardboard (to be verified)

MARBLETOWN:
- Ulster County Community College: newspaper, cardboard, high grades (office and computer paper), metal cans, scrap metal, and auto batteries. Contact: Joe Budik or Marty Jordan (687-5187).
- Four-In-Tune Autoworks (and some auto body shops): scrap metal and cardboard. Contact: Pete Bartoletti (687-0588).
- High Falls Food Coop: recycling all materials Marbletown MRDS is collecting and composting food scraps by Coop members. Contact: Lou Gross
- STS Systems: pallets, cardboard, office paper

MARLBOROUGH: (No commercial recycling reported in 1990). Large amounts of apple pomace are generated in Marlboro. National Recycling, located in Marlboro, was one of the few recycling markets located in Ulster County (NRC has since closed, in March, 1991; Formisano Paper now has a facility in Marlborough).

NEW PALTZ (TOWN): Mandatory, by resolution stating Town policy, since 1989. Many businesses and institutions are recycling.

- Town offices: office paper and all IMA recyclables (255-0604).
- SUNY/New Paltz: all IMA recyclables (newspaper, cardboard, office paper, glass, metal cans, HDPE and PETE plastic) from offices, residents halls, kitchen areas; yard waste and brush chipped and managed on site. Contact: Jim Powers (257-3315).
- Ulster B.O.C.E.S.: cardboard, office paper (255-1400).
- NY State DEC Region 3: all IMA recyclables. Contact: Pat DeWitt (255-5453).
- New Paltz Schools: mixed paper (office paper, cardboard, newspaper) to hauler (All-Waste) in separate dumpster; glass, tin, plastic to New Paltz Recycling Center. Contact: Dick Giebelhaus (255-1314).
- Bicycle Rack: cardboard
- Dedrick's Pharmacy: cardboard, newspaper, plastic
- Hand Made and More gift shop: cardboard
- Mohonk Mountain House: recycles all IMA materials and sends fat and offal to renderer.
- Multi-family dwellings: Paltz Commons, Village Arms, Village Gardens; Colonial Arms (Feb., '91); Southside and University Gardens, plan to start recycling in summer '91.
- New Paltz restaurants, including Dominick's, The Bakery, Gay Ninety's Bistro, etc. are recycling cardboard, glass, metal cans, plastic.
- Many offices are recycling office paper and cardboard.
- Shop-rite: cardboard

OLIVE:

- Town of Olive offices: office and computer paper, IMA materials.
- Onteora Schools (in three towns): office and computer paper, cardboard, metal cans. Contact: Larry Schroeder (657-6384)
- Ashokan Department of Environmental Protection: office and computer paper, newspaper, glass and HDPE. Contact: Fran Paulmari
- Bread Alone Bakery: IMA materials. Contact: Dan Leader (657-3328)
- C.A.R. Shop: HDPE plastic automotive containers and waste oil; contact John Carney
- Country Inn: glass, tin, news; contact: Angela Erenberg
- Homestead Cabinets: IMA materials
- J. & J Automotive: waste oil (waste oil furnace) and IMA materials; contact: John Lanzarotta
- Paul's Service Station: waste oil and IMA materials; contact: Paul Bresciani
- Pet Fare Feeds: cardboard
- Rotron Storage Facility: office and computer paper; contact: Ed Hopp
- Weber's General Store: IMA materials; contact: Tim Weber

PLATTEKILL:

- Sis' Twist restaurant: cardboard, newspaper, glass, metal cans, plastic. Contact: Pearl Morse (883-9871)
- Aloha Acres Mobile Home Park: all IMA materials; contact Mike Baum.

ROCHESTER:
- Rondout Valley Central Schools: planning paper recycling program; recycling styrene foam from cafeteria through Plastics Again. Contact: Peter Zegel or Joan Decker (687-7631).

ROSENDALE: Mandatory since 1988. Many businesses and institutions are recycling.
- Town Hall and town offices: all materials Rosendale MRDS accepts.
- Villa Bianca restaurant: glass, metal cans, plastic.
- Multi-family: Cottekill Village; contact Sidney Reis
- Fann's: cardboard

SAUGERTIES (TOWN):
- Saugerties Town offices, Saugerties Schools: office paper, magazines, junk mail
- Colonial Oil and Gas: junk mail, magazines, cardboard; plan to upgrade to office paper separation; in process of doing waste audit; considering waste oil
- Grand Union: cardboard, to market in Canada
- Kraus' Candies, CVS, Saugerties Furniture Mart: cardboard to Saugerties Recycling Center.
- KTB Printing: recycling large amounts of paper; constructing a building, with conveyor and baler to increase recycling; marketing directly. Contact: Tom Clemente (246-9552)
- Restaurants, including Cafe Tamayo, recycling cardboard and container materials
- Rotron: bales and markets office paper and cardboard directly to National Recycling; aluminum scrap direct to market; wood to Saugerties Recycling Center. Contact: Ed Hopp (679-2401)
- Saugerties Packaging: all paper marketed directly to Yank Waste
- Sawyer Bank: shredded office paper
- Senior Citizen's newspaper drop-off program.

SHANDAKEN:
- Bellayre: has not yet started; are planning recycling program; contact: Dick Clark (254-5601)
- Woodland Valley: also planning; Paul Johnson.
- Onteora Schools (in three towns): recycling computer paper, cardboard, metal cans from juice machines. Cooperative effort with Rotron. Contact: Larry Schroeder
- 4 tubing businesses and about 20 restaurants (have not yet started recycling)

SHAWANGUNK:
- Shawangunk/Wallkill Correctional Facilities: all IMA materials, marketed directly; large scale composting operation Contacts: Charlie Landi (895-2081 ext. 230) and Jim Marion (434-2080 ext. 309).
- Wallkill School District: office and computer paper, cardboard and bottles and cans from cafeteria. Contact: Barbara Wolfing (895-2048).

ULSTER (TOWN):
- Sears: cardboard.
- IBM--since 1988, intensive recycling of office and computer paper (marketed directly), also styrene foam and pallets; news, glass, metal cans and plastic to Town of Ulster MRDS. Contact: Tom Buckley (385-6423).

WARWARSING:
- Eastern/Ulster at Napanoch: cardboard and tin since Nov.'90; phasing in office paper and all IMA materials

WOODSTOCK:
- Town offices, Library, and Schools: office and computer paper, cardboard, and other IMA materials.
- Onteora Schools (in three towns)--see Shandaken. Contact: Larry Schroeder
- Cardboard from many retail stores.
- Grand Union: cardboard to UCS until June '90; now baled and sent Waterford, NY plant; also baling plastic bags (679-5811).
- Restaurants, including Margaret's, Bear Cafe, Misty's and Shirley's: mainly glass bottles; some cardboard
- Rotron: paper directly to market; glass and plastic to Woodstock MRDS.
- Wilson State Park: glass, metal cans and HDPE and PET plastic. Boy Scouts return Bottle Bill containers for refund; other materials to Woodstock MRDS. Contact: Len Bouren (255-5453 ext. 328).
- Woodstock Health Food Center and Sunflower Market: mainly cardboard
- Woodstock Childrens Center: all IMA materials.

TABLE 2-9

Existing Ulster County Recycling Businesses

o Edgemere Development Corp./ Ulster County Sanitation U.P.O. Box 3155 Kingston, NY 12401	Contact: Mr. Mike Guntlow C & D recycling; sorting commingled curbside (914) 338-8011
o Buck's Used Auto Parts (Route 213, Eddyville) P.O. Box 2462 Kingston, N.Y. 12401	Contact: Frank Pronesti Used automobiles and parts (914) 338-3131
o Ellenville Scrap Metal 34 Cape Rd. Ellenville, NY 12428	Contact: Al Koplick Scrap metal and cans (914) 647-5460
o Kingston Recycling, Inc. 642 Abeel St. Kingston, NY 12401	Mr. Bob Metz Scrap metal/junk cars (914) 331-3312
o Metropolitan Mining Co., Inc. 58-30 57th St. Maspeth, NY 11378	Mr. Ken Flood Multi-materials plant in Saugerties (718) 894-5025 (formerly Eveready Beverage)
o Mike's Scrap Metal 299 S. Wall St. Kingston, NY 12401	(914) 331-4027 Non-ferrous scrap metals
o B. Millens and Sons 290 E. Strand Kingston, N.Y. 12401	Mr. Barney Millens Scrap metal (914) 331-7600
o P & D Surplus 198 Abeel St. Kingston, NY 12401	Mr. Donald Hines Non-ferrous scrap metal (914) 338-6191
o National Resource Recovery (formerly National Recycling) Riverview Industrial Park P.O. Box 598 Marlboro, N.Y. 12542	Ms. Randy Schiller OCC, High grades, paper destruction services (914) 236-7800 [closed May, 1991]
o Salvation Army Thrift Stores 884 Albany Ave Ext. Kingston, NY Rt. 32 North, New Paltz, NY 12561	(Used clothing, furniture) (914) 331-1803
o Tire Recycling Inc. Quarry Road P.O. Box 264 Saugerties, NY 12477	Mr. Bill Reinhardt (914) 246-0700 Under consent order--permit pending for tire recycling

Kingston, Wawarsing, Rondout, and Onteora school districts. Ulster County Community College has an expanding recycling program.

In November, 1990, a pilot office paper recycling program, coordinated by the UCRRA, was initiated in the Ulster County Office Buildings Complex. This program is generating approximately one ton per month of high grade office and computer paper and a third of a ton of newspaper and cardboard. Ulster County Department of Public Works routinely recycles waste oil and lead-acid batteries.

In 1990, Benedictine and Kingston Hospitals began recycling in offices and food service areas. This also occurred at the Ulster County Jail.

The Frost Valley YMCA Environmental Education Center in Claryville (Town of Denning) serves about 30,000 visitors each year. Frost Valley has instituted a very comprehensive recycling program which includes all grades of paper, glass, metal cans, plastic, scrap metal, and waste oil. In 1990, Frost Valley built an in-vessel composting facility which handles a major portion of the organic waste generated on site, including food waste, waste paper, and yard waste. In the last four months of 1990 (off season) they composted 20 tons of material.

The UCRRA has started to establish a local waste exchange, as well as monitoring the state and regional exchanges for use by local businesses and institutions.

In order to better assess existing recycling commercial, industrial, and institutional efforts and to establish a baseline from which to measure the progress of a concerted, countywide commercial/institutional recycling program, a preliminary telephone survey was done asking each municipal recycling coordinator (MRC) for a listing of businesses and institutions in their community who were already recycling. Refer to Table 2-8 for a listing of preliminary information obtained regarding local commercial, industrial, and institutional recycling efforts. It is not comprehensive. For example, many other automobile service centers already recycle tires, batteries, waste oil, and scrap metal. Table 2-10a lists recycling volume data from two commercial businesses and one institution in 1989, and from 38 businesses, seven institutions, and one commercial hauler in 1990.

A worksheet has been distributed for use by the MRCs to keep track of local commercial/institutional/industrial recycling efforts. The MRCs will be trained to help businesses to do waste audits and report volumes being recycled. They will focus on helping businesses and institutions that are not yet recycling. Waste reduction strategies and local waste exchanges will be important to this program.

In 1990, the Agency received over 40 telephone inquiries on commercial recycling. Commercial recycling information was sent to each caller and their business was added to a mailing list for the planned Commercial/Institutional Recycling Seminar. Many of these are already actively phasing in office paper recycling programs.

Table 2-10b

1989/1990 Recycling Data (MRDS & Commercial/Institutional/Industrial)

MATERIAL:	1989 MRDS (tons)	1989 C/I/I to MRDS	1989 * C/I/I (tons)	1989 Total (tons)	1990 MRDS (tons)	1990 C/I/I to MRDS	1990 * C/I/I (tons)	1990 Total (tons)
Newspaper	2,033	-	-	2,033	2,735	31	6	2,741
Cardboard	663	1	355	1,018	831	1	480	1,311
Office Paper **	96	-	989	1,085	30	4	967	997
Computer paper	*	-	-	0	*	2	21	21
Glass	1,163	4	-	1,163	1,583	38	-	1,583
Metal Cans	280	5	-	280	480	7	54	534
Plastic	33	3	-	33	160	9	2	162
Scrap Metal	2,693	-	191	2,884	4,147	-	266	4,413
Magazines	-	-	-	0	24	-	-	24
Phone books	-	-	-	0	1	-	-	1
Brown bags	-	-	-	0	11	-	-	11
Other paper	-	-	-	0	-	-	-	0
Other plastic (styrene foam)	-	-	-	0	2	-	9	11
Tires	218	-	-	218	523	-	37	560
Waste oil	-	-	-	0	33	-	13	46
Batteries	3	-	-	3	30	-	22	52
Paint	4	-	-	4	3	-	-	3
Compost:	2,367	-	-	2,367				
Leaf	-	-	-	0	2,295	-	-	2,295
Brush/Wood Waste	-	-	-	0	2,287	-	-	2,287
Sludge	-	-	-	0	19	-	-	19
Wood pallets	-	-	-	0	-	-	121	121
Food waste	-	-	-	0	20	-	45	65
Commingled (news,glass,cans)	101	-	-	101	-	-	-	0
Other (several materials reported as one amount)	-	-	75	75	-	-	-	0
TOTAL	9,654	13	1,610	11,264	15,214	92	2,043	17,257

MRDS = Municipal Recycling Drop-off Site

C/I/I = comm./inst./industrial

* Marketed directly by business or institution

** Computer paper in with Office paper

2.3.8 MUNICIPAL RECYCLING COORDINATORS' ROUNDTABLE

One of the unique features of Ulster County's recycling program is the system of monthly Municipal Recycling Coordinators' (MRCs) Roundtable meetings, of which 30 were held between July 19, 1988 and February, 1991. Through this vehicle, the Agency has been able to closely monitor the development of municipal recycling programs and to determine the needs of the municipalities for a countywide program. This network of MRCs has been an integral part of the planning process. Each MRC serves as a direct liaison between the Town Board of their municipality and the Agency. The ongoing dialogue provided by the MRC Roundtable has helped to keep channels of communications open. Regular meetings between Agency staff and the Town Supervisors' Association, as well as frequent individual presentations to the Town Boards, furthers this process.

2.3.9 RECYCLING VOLUMES: 1988 - 1990

In 1988 approximately 2,500 to 3,500 tons of materials were recycled in Ulster County resulting in an estimated 8% recycling rate. These recycling volumes were a result of volunteer municipal recycling development projects (as described in Section 2.3.2 of this document). It must be noted that the 1988 volumes are estimates since no formal Countywide recycling reporting system was in place. These estimates should be considered conservative since the recycling of scrap metal, C&D wastes, apple and grape pomace, yard waste, and others were not included. For a more detailed discussion of 1988 recycling volumes, the reader is referred to the DGEIS, Volume IV (RAP), page 2-6.

In 1989 the UCRRA developed a Countywide reporting and tracking system to more accurately record the amount of recyclable materials being collected and marketed by the Existing Municipal Recycling Programs; the Commercial, Institutional, and Industrial Sectors; and the UCRRA Recycling Development Projects. This tracking system was further refined in 1990 to include reporting of municipal, institutional, and commercial composting activities. In 1991 the system will be expanded to record all recycling, composting, and solid waste disposal that occurs within Ulster County.

The chart below depicts the volumes of recyclables reported under the tracking system from 1988-1990.

1988-1990 Recycling Volumes Reported Under UCRRA Tracking System (in tons)

	1988	1989	1990
Recycling Development Projects			
Newspaper	36	1,253	1,841
Bottles & Cans	15	105	-
Existing Municipal Programs		8,296	13,375
Commercial Recycling	*2,949	1,535	1,716
Institutional Recycling		75	325
Total Reported Volumes	3,000	11,264	17,257

* Estimated Combined Total of Municipal, Commercial, and Institutional.

The sharp increase from approximately 3,000 tons in 1988 to 11,264 tons in 1989 to 17,257 tons in 1990 is a result of 3 factors:

1. Increased public awareness and education caused a higher degree of public participation in recycling;

2. The UCRRA recycling development projects were proving to be highly successful;

3. The Countywide tracking system was accounting for private (commercial) sector recycling which was not previously reported.

Table 2-10a, 1989-1990 Recycling Data shows all reported recycling information by material for those years.

The 1989 commercial and institutional recycling data was reported by two commercial businesses and one institution and reflects only those materials marketed directly. An additional 13 tons were brought to municipal recycling drop-off centers by commercial and institutional generators and were included in municipal efforts.

It should be noted that, with the expanded newspaper development project in 1989, Agency recycling programs accounted for 12% of total recycling while existing municipal recycling efforts accounted for 74% and commercial/institutional efforts accounted for 14% of the 11,264 tons reported. This ratio dropped slightly in 1990 (11% UCRRA newspaper development project, 77% existing municipal efforts, and 12% commercial/institutional).

It is expected that these proportions will shift dramatically in 1991, as more of the existing municipal recycling efforts are coordinated by the UCRRA and are included in the Satellite Aggregation Center (SAC) Systems (see Section 2.3.10).

The 1990 commercial and institution recycling data reflects reporting from 38 businesses, 7 institutions, and one commercial hauler. In addition to the 2,041 tons marketed directly by commercial/institutional sector, another 92 tons was sent to municipal recycling programs, and is included are those figures.

Table 2-10b indicates volumes of each recyclable material collected by the towns and by the commercial/institutional/industrial sectors in 1990. In 1990, one commercial hauler began to bring recyclables collected at curbside directly to their facility, rather than to the municipal drop-off centers, for further processing. Newspaper was then included in the UCRRA development project, but other materials were marketed directly by the hauler.

2.4 SATELLITE AGGREGATION CENTERS (SAC) SYSTEM (1990-1991)

As stated earlier, a major goal of this Plan is to ensure that waste reduction, recycling, and reuse are maximized to the greatest extent that is technically practical and economically feasible. In order to achieve this, UCRRA in 1989 began implementing a **major materials recycling program** in cooperation with Ulster County municipalities. This program came to be known as the Satellite Aggregation Center (SAC) System. A full detailed discussion and supporting data outlining the need and basis for the SAC System can be found in:

a) DGEIS, Volume IV Recycling Action Plan (RAP)*
b) Findings Statement, Section 2.0 (Establish a Countywide Reduction, Reuse, and Recycling Program);
c) Chapter 3.0 of this document (Solid Waste Quantities and Characteristics);
d) Chapter 4.0 of this document (Analysis of Recycling Markets and Materials);

(* Note - In the DGEIS, Recycling Action Plan (RAP), the SAC System is referred to as an Intermediate Processing Center. The name was changed to Satellite Aggregation Centers in late 1989 after the RAP was written.)

Table 2-10a

'90 Total-revised

Total 1990 Recycling (in tons)

	GLASS Clear	Green	Amber	Total Glass	PAPER ONP	..... OCC	High Grade	Other	Total Paper	PLASTIC PETE	..... HDPE	..... Other	Total Plastic	METAL CANS-Tin	Alum.	Total Metal Cans	Total IMA	Scrap Metal Ferrous	Alum.	Scrap Metal Total	IMA+ Scrap
Denning *									150.32					11.73		11.73	196.68	196.89		196.89	393.57
Esopus	24.24	6.93	3.46	34.63	143.21	7.11			99.03	3.45	7.52	2.25	13.22		2.05	2.05	168.66	100.00		100.00	268.66
Gardiner	38.51	10.88	4.97	54.36	66.88	18.92	13.23		0.50								0.50				0.50
Hardenburgh					0.50				175.39		9.03		9.03	34.00	0.21	34.21	279.08				279.08
Hurley	42.32	12.09	6.05	60.45	160.79	14.60			1,464.21		40.53		40.53	96.03		96.03	1,833.58	288.21		288.21	2,121.79
Kingston (City)	204.87	18.63	9.31	232.81	843.28	620.93			65.83								74.73	14.40		14.40	89.13
Kingston (Town)	5.88	1.97	1.05	8.90	64.21	1.62			51.33								51.33	240.00		240.00	291.33
Lloyd					51.33				126.27		8.00		8.00	13.99		13.99	198.41	198.50		198.50	396.91
Marbletown	35.11	10.03	5.02	50.15	120.27	6.00			33.06								33.06	426.00		426.00	459.06
Marlborough					33.06				360.26		16.35		16.35	68.75		68.75	636.86	280.00	3.00	283.00	919.86
New Paltz (T&V)	118.35	48.77	24.38	191.50	277.93	73.49	8.84		57.00		2.00		2.00	14.00		14.00	131.50	80.00		80.00	211.50
Olive	40.95	11.70	5.85	58.50	56.50		0.50		46.05		3.25		3.25	9.92		9.92	76.67	166.24		166.24	242.91
Plattekill	11.36	5.16	0.93	17.45	43.65	2.40			42.69					10.00		10.00	106.69	300.00		300.00	406.69
Rochester	37.80	10.80	5.40	54.00	42.69				167.01		12.00		12.00	37.30		37.30	315.96	235.00		235.00	550.96
Rosendale	69.76	19.93	9.96	99.65	167.01				239.50		9.55		9.55	47.50		47.50	477.05	100.00		100.00	577.05
Saugerties (T&V)	112.41	43.45	24.64	180.50	188.40	48.10	3.00		2.68								2.68	0.00		0.00	2.68
Shandaken **					2.68				72.31		1.10	0.02	1.12	4.79	0.74	5.53	102.33	0.00		0.00	102.33
Shawangunk	18.75	3.15	1.47	23.37	68.68	1.23	2.40		185.73		19.60		19.60	36.10		36.10	357.33	516.00		516.00	873.33
Ulster (Town)	81.13	23.18	11.59	115.90	185.73				123.20					15.65		15.65	190.05	843.33		843.33	1,033.38
Warwarsing (T&V)	35.84	10.24	5.12	51.20	123.20				131.89		8.28		8.28	13.88	0.72	14.60	223.72	160.00		160.00	383.72
Woodstock	48.27	13.79	6.90	68.95	95.33	34.56	2.00		3,594.26	3.45	137.21	2.27	142.93	413.64	3.72	417.36	5,456.87	4,144.57	3.00	4,147.57	9,604.44
Total (MRDS)	925.54	250.70	126.09	1,302.32	2,735.33	828.96	29.97														
EMC NHH									2.20		18.64		18.64	62.80		62.80	364.77				364.77
DCS Curbside (est.)	186.46	67.65	27.02	281.13	w/towns	2.20			3,596.46	3.45	155.85	2.27	161.57	476.44	3.72	480.16	5,821.64	4,144.57	3.00	4,147.57	9,969.21
MRDS+NHH+curbside	1,112.00	318.35	153.11	1,583.45	2,735.33	831.16	29.97		1,473.29		2.40	8.55	10.95	53.77		53.77	1,538.01	262.46	3.20	265.66	1,803.67
Comm/Inst/Indust.	0.00	0.00	0.00	0.00	6.10	479.42	987.77		5,069.75	3.45	158.25	10.82	172.52	530.21	3.72	533.93	7,359.65	4,407.03	6.20	4,413.23	11,772.88
Total (all)	1,112.00	296.53	148.26	1,583.45	2,741.43	1,310.58	1017.74														

revised 5/2/91

* 1% of Woodstock

** 20-25% of "

" minus T/Ulster

'incl 2.5 antifreez

Table 2-10a cont'd
'90 Total-revised

Total 1990 Recycling (in tons)

	Mags.	Junk Mail	Phone Books	Brown Bags	Other Paper	Paint	HH Batt.	Auto Batt.	Tires	Waste Oil	Leaf Compost	Yard Waste	Lf/Yd Total	C&D Wood Waste	C & D Rubble	w/cover) Sludge	Annual Food Waste	Non IMA Total	Non-IMA + Scrap	1990 Total
Denning *								2.00		1.83		16.25	16.25				20.00	40.08	40.08	40.08
Esopus											68.00	68.75	136.75					136.75	333.64	530.32
Gardiner								2.34	18.75	2.80								23.89	123.89	292.55
Hardenburgh																				0.50
Hurley				1.30				2.19	10.00	4.02	108.00	22.50	130.50					148.01	148.01	427.09
Kingston (City)				w/OCC							366.00	1,227.40	1,593.40	365.63				1,593.40	1,881.61	3,715.19
Kingston (Town)				0.13														0.13	14.53	89.26
Lloyd									11.22	2.01	48.00	185.00	233.00	122.50				246.23	686.23	537.56
Marbletown								0.57			38.00		38.00	11.25				38.57	237.07	435.48
Marlborough									206.00		60.00		60.00	336.25				266.00	692.00	725.06
New Paltz (I&V)	8.00			w/OCC				7.68	20.00	6.48	327.00	71.25	398.25	135.00	1,522.50	18.76		459.17	742.17	1,379.03
Olive								2.89	134.00	4.20	111.00		111.00					252.09	332.09	463.59
Plattekill	1.60								10.00		176.00	100.00	276.00	16.25				287.60	453.84	530.51
Rochester														28.75					300.00	406.69
Rosendale								2.22	56.00		33.00		33.00					91.22	326.22	642.18
Saugerties (I&V)			0.50	4.25					50.00		354.00	330.00	684.00	386.25				738.75	838.75	1,315.80
Shandaken **																			0.00	2.68
Shawangunk								3.02			116.50	122.50	239.00	153.75				242.02	242.02	344.35
Ulster (Town)											203.00	125.00	328.00	73.75				328.00	844.00	1,201.33
Warwarsing (I&V)											177.00		177.00	8.75				177.00	1,020.33	1,210.38
Woodstock	14.00		0.60	5.47			0.05	3.00	7.00	8.12	110.00	18.75	128.75					166.99	326.99	550.71
Total (MRDS)	23.60		1.10	11.15			0.05	25.91	522.97	29.46	2,295.50	2,287.40	4,582.90	1,638.13	0.00	18.76	20.00	5,235.90	9,383.47	14,840.34
EMC HHW						2.85	0.50	3.80		3.65								10.80	10.80	10.80
UCS Curbside (est.)^																				364.77
MRDS+HHW+curbside	23.60		1.10	11.15		2.85	0.55	29.71	522.97	33.11	2,295.50	2,287.40	4,582.90	1,638.13	0.00	18.76	20.00	5,246.70	9,394.27	15,215.91
Comm/Inst/Indust.								22.14	36.55	12.46	Pallets:	120.90	120.90				45.20	237.25	502.91	2,040.92
Total (all)	23.60		1.10	11.15		2.85	0.55	51.85	559.52	45.57	2,295.50	2,408.30	4,703.80	1,638.13	0.00	18.76	65.20	5,483.95	9,897.18	17,256.83

revised 5/2/91

* .1% of Woodstock

** 20 25% of "

Major materials recycling generally refers to those waste materials that can be readily separated from the waste stream and placed in individual containers for collection or drop-off. Newspaper, glass containers, metal cans, plastic containers, office paper, and corrugated cardboard are included in the category of major materials recycling. Usually excluded from discussions of materials recycling are other potentially recyclable products that are not commonly or frequently generated in the home and are not easily segregated and collected in separate containers by homeowners. These materials may include construction and demolition (C&D) debris, yard wastes, food and other organic wastes, rubber, and textiles among others.

Data related to the Comprehensive Recycling Analysis can be found in Chapters 2.0, 3.0, and 4.0 of this document and the DGEIS, Volume IV (RAP). This data establishes the need for recycling in the County and identifies the amounts of recyclable materials found in the waste stream. The market list found in Chapter 4.0 indicates that the development of recycling is an integral component of the County's Solid Waste Management Plan and will be dependent upon market conditions, participation levels, and economic considerations. The "Plan" also provides for the establishment of countywide comprehensive reduction, reuse, and recycling programs geared to exceeding the State's goal of reducing the solid waste stream by 50% through reduction and recycling by 1997.

UCRRA has determined that the best strategy for implementing a **major materials recycling program** is through the establishment of a Countywide **Satellite Aggregation Center (SAC) System.** Under the SAC System, the County would provide collection equipment, transportation, processing, marketing services, and other services for the municipalities who elect to participate. The municipalities would be responsible for the setting up of localized Municipal Recycling Drop-off Sites (MRDS) and ensuring that recyclables collected at the MRDS be included in the system in a condition suitable for marketing. Other specific responsibilities of both the Agency and participating municipalities are spelled out under the terms of the Intermunicipal Agreement (IMA) signed by both parties. The list of major materials presently being recycled under the IMA is the same as the list of "Regulated Recyclable Materials" included in the County's Proposed Mandatory Source Separation and Recycling Legislation.

UCRRA has also determined that a countywide SAC System be implemented in phases, thereby providing a basis for measuring its impact and identifying the specific activities that should be implemented in future phases. A phased approach also serves to ensure maximum public participation and program efficiency. Section 9.3.3 of this document describes in detail the specific components of the SAC System. A SAC System implementation schedule (1989-1997) can also be found in Section 9.3.3 of this document.

2.5 EXISTING COMPOSTING/YARD WASTE HANDLING FACILITIES

Of the 24 municipalities in Ulster County, 16 have established some sort of facility for handling compost and/or yard waste. The Agency has been working with these municipalities by providing technical assistance in preparing compost sites and by grinding (utilizing the Agency's "Tub Grinder") yard and wood wastes down to compostable sized particles. These municipalities have established yard waste handling programs designed to separate the yard and clean wood waste from the waste stream, thereby preventing them from entering the landfill and making them more amenable to composting. The three villages (Ellenville, New Paltz, and Saugerties) utilize their respective town facilities for handling their yard waste. Five townships are either in the process of establishing their composting programs or have no apparent need for one. Listed below is a brief assessment and status of each municipalities composting and/or yard waste handling program:

Denning - The population density is so low and there is so much open space where natural yard waste composting occurs that this town does not need a yard waste handling facility. Many of the residents have created their own "back-yard" composting piles. However, the YMCA Camp at Frost Valley has built a composting building in which they grind the food waste collected from their kitchen and mix it with wood chips, pile it and inject air into the pile for hastening of the process. This is still in its trial stages, but seems successful.

Esopus - Their leaf composting is done at the eastern edge of the landfill and is turned occasionally. Yard waste is ground up at the southeast corner and has been used as fill to level in a better grinding area. It has also been mixed with the soil and used as final landfill cover.

Gardiner - Has plans to establish a leaf and yard waste composting site. This will be done by the time the County's Mandatory Source Separation and Recycling Law goes into effect. Under the propose "Law" yard waste must be separated from the waste stream and composted. The planned date for implementation is March 31, 1991.

Hardenburgh - The population density is so low and there is so much open space where natural yard waste composting occurs, that this town does not need a yard waste handling facility. Many residents have created their own "back yard" composting piles.

Hurley - Leaf composting is done in conjunction with the ground up brush and tree trimmings and is located next to the Highway Garage. The pile is regularly maintained and is being used up by the public.

City of Kingston - Composting of leaves in windrows is at a site on Wilbur Avenue where it is well-drained and is turned on a regular basis. Yard waste grinding is done on a site off of West O'Reilly Street next to a cemetery and this material is being used for filling in a ravine.

Town of Kingston - The population density is so low and there is so much open space where natural composting occurs, that this town does not need a yard waste handling facility.

Lloyd - There was some leaf composting mixed with ground-up greenery and kept in a pile at the northeast edge of the landfill and used as landfill cover. The ground up yard waste was also used to level the area for facilitating future grinding. A site is being prepared for future composting.

Marbletown - This town has no landfill of its own, but does have a recycling center at which there is a fenced area for collecting and composting leaves. Yard waste grinding had been done and the material was used to cover the ground for future work. Future yard waste handling at this facility is questionable because of space constraints. Plans for an alternative site are being considered.

Marlborough - Leaves are stockpiled near the landfill and are left to decompose and later used as landfill cover. Yard waste is ground on the eastern edge of the landfill. It is then mixed with soil and used as cover for the landfill. There are plans to prepare a better site for composting.

Town of New Paltz - Grinding of yard waste is done on a regular basis. Some of the material is mixed with the leaf compost pile to enhance the quantity and the quality of the compost which is offered to the community. The rest of the material is stockpiled and/or mixed with soil and used as landfill cover.

Village of New Paltz - Utilizes the Town of New Paltz's facility.

Olive - Some stockpiling of leaves for composting occurs, but because there is so much open space in the town, the volume brought to the landfill is low. The Town is preparing a location at the south end of the landfill for future grinding of yard waste.

Plattekill - Yard waste is done at this site on the west end of the landfill both for composting and volume reduction. The compost piles is in fair shape and is turned occasionally. The volume reduced material is disposed of in the landfill.

Rochester - To date, yard wastes and mixed (clean and painted) wood wastes are handled together. The wastes are ground to reduce the volume and placed directly into the landfill. There are plans to develop a compost area at the landfill in the future. However, the volume of leaves is low due to residential back yard composting and the many farmers who make their own compost.

Rosendale - Because of space constraints, grinding is, at the present time, not possible at this location. However, leaves and grass clippings are brought here for composting and are subsequently used up. Plans for an alternative site are being considered.

Town of Saugerties - Located at the northern end of the landfill, this compost facility handles leaves, grass clippings, and ground up yard waste. Wood wastes are kept separate and ground up for volume reduction before being placed in the landfill. Large amounts of materials are properly handled at this location.

Village of Saugerties - Utilizes the Town of Saugerties facility.

Shandaken - The population density is somewhat low and since there is a large amount of open space where natural yard waste composting occurs, this municipality does not need a large scale composting facility. However, there is a need to establish a site for grinding and volume reducing some yard and wood waste that would be disposed of in a neighboring community's landfill. Plans for establishing such a site are under consideration.

Shawangunk - The Wallkill Prison on Route 208 is the primary location for this town for yard waste handling program. The Prison has an on-site compost pile consisting of yard waste and food waste. Grinding of green brush and clean wood occurs here. The wood chips are mixed into the Prison's windrows. Also, volume reduction of wood waste for the Town is done at the edge of the landfill and is disposed of in the landfill.

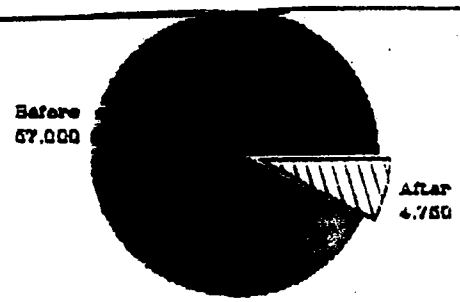
Ulster - This facility has three separate piles of material; a long row for leaf composting; a pile of chips created by grinding clean brush and wood; and, one pile of volume reduced wood for landfilling. The leaf compost gets turned on a regular basis and is being used up by contractors and the Highway Department for landscaping purposes.

Wawarsing - Composting is just beginning at this landfill. Yard waste is now being stockpiled for grinding, and a location is being prepared for composting.

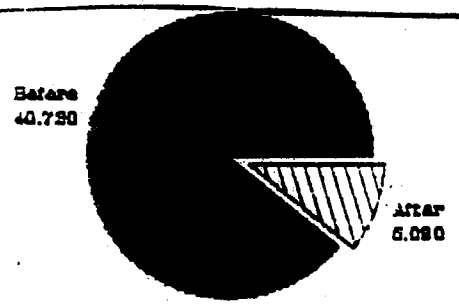
Village of Ellenville - Utilizes the Town of Wawarsing facility.

Woodstock - Some leaf collecting and composting is done at the Town landfill, but most of it is being "back yard" composted. There is an accumulation of yard waste which is expected to be ground up in the near future.

Table 2-11a and 2-11b shows the amounts of leaf, yard, and wood wastes in cubic yards and tons, respectively, that were either composted or volume reduced (by tub grinding) for a period of five months (September - December, 1990). These figures were obtained from each municipality that participated in the County's Cooperative Municipal Composting Program which began in late August 1990. The volume figures for leaf waste were obtained prior to composting when leaves were deposited at the Towns facility. The volumes for yard and wood waste represent the amount of material collected after grinding had occurred. Generally speaking, on the average, grinding reduces the volume of yard and wood wastes in a 10:1 ratio. Yard waste can be reduced by 12:1 while wood wastes may be reduced 8:1. Composting after grinding will further reduce the volume. The pie charts below shows the effects grinding has had on the volume of waste during September - December 1990.



Cu.Yds.Yard Waste



Cu.Yds.Wood Waste

TABLE 2 - 11A
LEAF, YARD & WOOD WASTE COMPOST VOLUME DATA BY CUBIC YARDS
(SEPT. - DEC. 1990)

TOWNS	LEAF COMPOST CU. YDS	YARD WASTE WASTE CU. YDS	WOOD WASTE CU. YDS
DENNING		65	
ESOPUS	450	275	
GARDINER			
HARDENBURGH			
HURLEY	720	90	
KINGSTON(C)	2,440	575	
KINGSTON(T)			
LLOYD	320	740	490
MARBLETOWN	250		45
MARLBOROUGH	400		1,345
NEW PALTZ	2,180	285	540
OLIVE	740		
PLATTEKILL	1,170	400	65
ROCHESTER			115
ROSENDALE	220		
SAUGERTIES	2,360	1,320	1,545
SHANDAKEN			
SHAWANGUNK	770	490	615
ULSTER	1,350	435	295
WARWARSING	1,180		35
WOODSTOCK	730	75	
TOTAL	15,280	4,750	5,090

TABLE 2 - 11B
LEAF, YARD & WOOD WASTE COMPOST VOLUME DATA BY TONS
(SEPT. - DEC. 1990)

TOWNS	LEAF COMPOST TONS	YARD WASTE WASTE TONS	WOOD WASTE TONS
DENNING		16	
ESOPUS	68	69	
GARDINER			
HARDENBURGH			
HURLEY	108	23	
KINGSTON(C)	366	144	
KINGSTON(T)			
LLOYD	48	185	123
MARBLETOWN	38		11
MARLBOROUGH	60		336
NEW PALTZ	327	71	135
OLIVE	111		
PLATTEKILL	176	100	16
ROCHESTER			29
ROSENDALE	33		
SAUGERTIES	354	330	386
SHANDAKEN			
SHAWANGUNK	116	123	154
ULSTER	203	109	74
WARWARSING	177		9
WOODSTOCK	110	19	
TOTAL	2,295	1,189	1,273

3.0 SOLID WASTE QUANTITIES AND CHARACTERISTICS

3.0 SOLID WASTE STREAM ANALYSIS

3.1 SOLID WASTE STREAM ANALYSIS - METHODOLOGY

One of the major components in developing a solid waste management plan is an analysis of the solid waste stream in terms of current and projected quantities and composition. To develop projections of waste quantities, estimates of the current population and projections of population growth must be considered. This information was used to estimate the quantity of waste generated in the County in 1988 and to project the solid waste stream quantity through the year 2014. In addition, an analysis of the composition of the 1988 solid waste stream was conducted. This information was used to identify recyclable materials in the waste stream, and to estimate the potential effect of countywide recycling on the quantity of waste generated. Data from the analysis of the waste stream was also used in the evaluation of technologies for the processing/disposal of that portion of the waste stream that will not be recycled. This data will, among other things, help to determine the size of proposed facilities and the feasibility of potential sites.

The estimates of waste quantities presented in this section are based on several background and field analysis. Sources of data include:

- Review of previous solid waste management and recycling studies performed for the County;
- Information collected through a hauler survey performed in January 1988;
- Data collected from two one-week field analysis programs, performed in February 1988 and July 1988;
- Data collected during a vehicle count program with a duration of approximately three months conducted at the majority of the County's 15 landfills;
- City of Kingston Transfer Station Weigh records from 1980 to 1987;
- Field visit to Ulster County Landfills during January and May 1988;
- Discussions with solid waste generators;
- Discussions and meetings with the NYSDEC.

In addition, UCRRA's staff and consultants worked closely with officials of the Ulster County Health Department, and met with the Ulster County Planning Board, Environmental Management Council, and the Recycling Task Force to obtain available information.

The UCRRA is responsible for developing the County's Solid Waste Management Plan and for ultimately determining which wastes must be managed under that plan. In addition to the wastes defined in the New York State Solid Waste Management Act of 1988, UCRRA requested that five other waste streams be included in its plan (leaf & yard wastes, tires, waste oil, and apple & grape pomace). Household hazardous wastes were also considered as part of the residential waste stream. In December 1990, UCRRA included Medical Wastes as another waste stream component to be analyzed and managed accordingly. Table 3-1 lists the resulting 17 components of the County's waste stream that have been considered in this Solid Waste Management Plan.

TABLE 3-1

ULSTER COUNTY
SOLID WASTE STREAM COMPONENTS

Residential Waste	**Water Plant Sludge**
Commercial Waste	**Air Pollution Control Facility Sludge**
Non-Hazardous Industrial Waste	**Offal**
Apple Pomace	**Incinerator Residue**
Grape Pomace	**Tires**
Construction & Demolition Debris	**Waste Oil**
Sewage Plant Sludge	**Contained Gaseous Material**
Leaves & Yard Waste	**Power Plant Ash**
Medical Wastes	

Section 4.0 of the DGEIS describes in detail the analysis which has been performed on the solid waste stream generated in the County. A summary of that analysis is included in this section. For a detailed discussion of the Solid Waste Stream Analysis, the reader is referred to:

a) DGEIS, Volume I, Section 4.0
b) DGEIS, Volume II, Appendix D
c) Response Document, Sections 2.0 and 4.0
d) Supplemental Response Document, Section 3.0

3.2 POPULATION ESTIMATES AND PROJECTIONS

Solid waste quantity projections were determined by applying estimated projections of population and per capita solid waste generation rates to a base estimate of solid waste quantities. This sub-section presents data related to population projections. Since the County is developing a solid waste management program designed to serve the County's solid waste management needs for a period of 20 years from program implementation, population projections are presented through the year 2014 based on the preliminary assumption that the long term solid waste management program will be in operation by 1994. This allows for a program development period of up to five years (1989-1994) including procurement and facility permitting, design, and construction.

3.2.1 POPULATION ESTIMATES

Table 3-2 presents census data for the years 1950, 1960, 1970, and 1980. As shown in Table 3-2, the population has continued to increase each decade, but at a slower rate. Most recently, between 1970 and 1980, the County's census population increased from 141,241 to 158,158 persons, representing a gain of 12.0 percent. This rate of growth is somewhat below that of the previous decade, yet is consistent with the declining rate of population growth experienced in the County over the past 30 years. Table 3-2 also presents census data for the Mid-Hudson Valley Region and the United States for the years 1950, 1960, 1970, and 1980. A comparison of this data with the County data indicates that the County's 12.0 percent increase in population during the last decade was significantly higher than that of the Mid-Hudson Region (6.4 percent), but consistent with that of the nation (11.4 percent).

TABLE 3-2

UNITED STATES CENSUS DATA

YEAR	POPULATION	NUMERICAL CHANGE	PERCENT
Ulster County			
1950	92,621	--------	------
1960	118,804	26,183	28.3%
1970	141,241	22,437	18.9%
1980	158,158	16,917	12.0%
Mid-Hudson Region			
1950	514,622	-------	------
1960	634,234	119,612	23.2%
1970	778,428	114,194	22.7%
1980	828,319	49,891	6.4%
United States			
1950	150,216,110	-------	------
1960	179,325,657	29,109,547	19.4%
1970	203,302,031	23,976,374	13.4%
1980	226,504,825	23,202,794	11.4%

Source: Ulster County Data Book, 1984

3.2.2 POPULATION PROJECTIONS

The Ulster County Data Book presents population projections made by the County Planning Board through the year 2010. These Projections are based on those made by the New York State Department of Commerce (NYSDC) in 1985. Although both sets of data are similar, the NYSDC projections are reported in five year intervals, and, as such, provide more data points from which to interpolate

annual population increases. For this reason, the NYSDC population projections have been used as the basis for the long term population projections presented here.

Table 3-3 presents the annual projected population for the County for the period 1985 through 2014, based on the NYSDC population projections. Annual values through the year 2010 were interpolated from the five-year projections made by the NYSDC and are rounded to the nearest thousand. Since the planning period for the County's solid waste management program extends to the year 2014, it was necessary to project the population from 2010 to 2014. To make these projections, the annual average rate of population growth for the period 2000 to 2010 by the NYSDC was extrapolated and used to make projections for the period 2011 to 2014. This method, which assumes that the population growth will remain constant over the 14 year period, results in a population of 187,000 persons by the year 2014. Figure 3-1 represents the projected population for the County from 1980 to 2014.

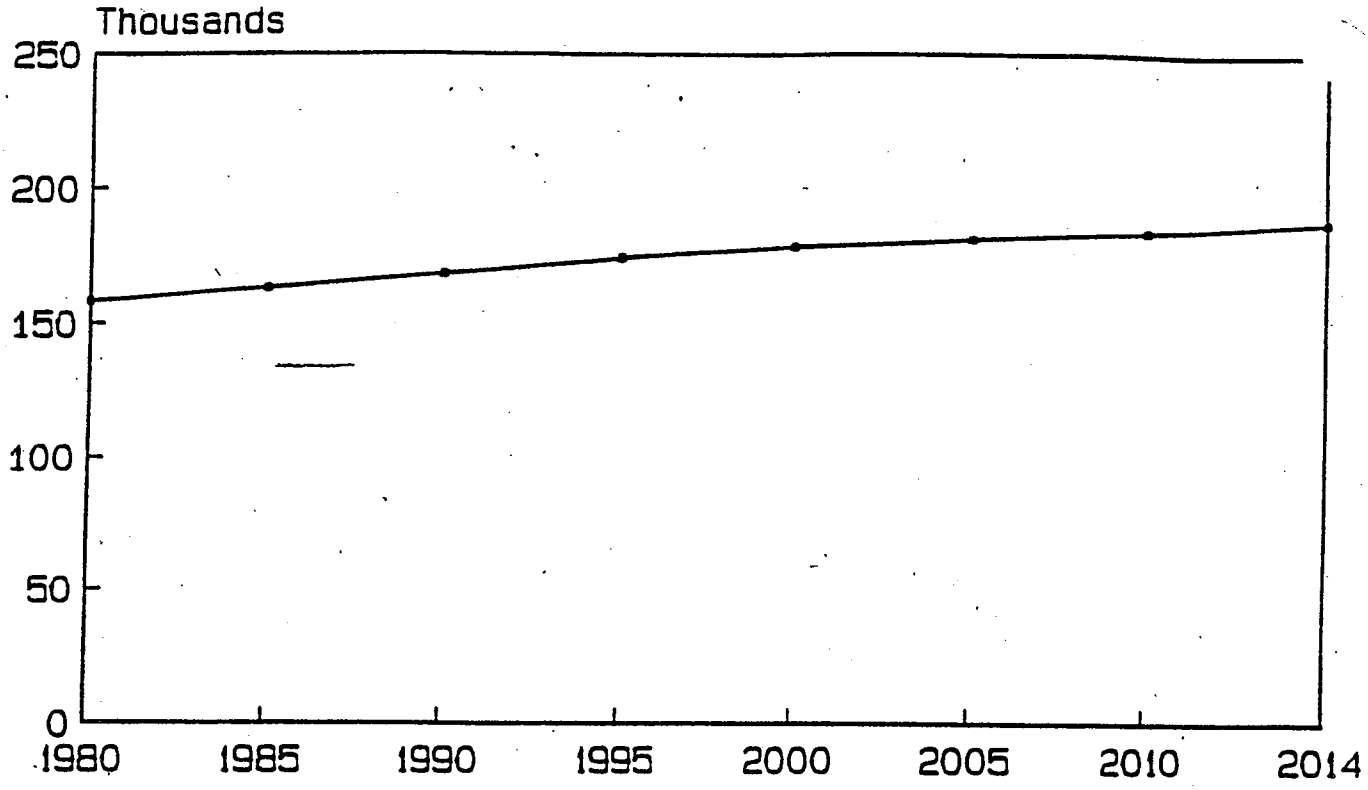
TABLE 3-3

ANNUAL ESTIMATED POPULATION PROJECTIONS FOR ULSTER COUNTY 1985 - 2014

Year	Population	Year	Population
1985	163,000	2001	179,000
1986	164,000	2002	179,000
1987	165,000	2003	180,000
1988	166,000	2004	181,000
1989	167,000	2005	181,000
1990	168,000	2006	182,000
1991	170,000	2007	182,000
1992	171,000	2008	183,000
1993	172,000	2009	184,000
1994	173,000	2010	184,000
1995	174,000	2011	185,000
1996	175,000	2012	185,000
1997	176,000	2013	186,000
1998	177,000	2014	187,000
1999	177,000		
2000	178,000		

Note: Values are rounded to the nearest thousand, based on extrapolation of NYSDC Official Population Projections for New York State Counties: 1980 - 2010

FIGURE 3-1



SOURCE :

1985-2010 NYSDC PROJECTIONS
2011-2014 EXTRAPOLATED BASED ON
AVERAGE RATE OF GROWTH 2000-2010

POPULATION PROJECTIONS
1980-2014

To quantify the waste stream, it was necessary to estimate the 1988 population of each municipality in the County. The 1988 population is estimated by linearly interpolating the 1980 United States Census data and the Ulster County Planning Board 1990 projections for each of the municipalities. This method assumes that the population increases at a constant rate over the ten-year period. Table 3-4 presents the estimated population for each of the municipalities in the County in 1988. The total estimated 1988 population in the County is approximately 166,000 persons. For a detailed discussion of population estimates and projections, the reader is referred to:

a) DGEIS, Volume I, Section 4.2, June 1989;
b) Ulster County Data Book, 1984, updated 1988;
c) NYSDC Population Projections for New York State Counties, 1980-2010, 1985

TABLE 3-4

POPULATION PROJECTIONS BY MUNICIPALITY

Municipality*	1980 Census Data	1988*** Est. Population	1990** Projected Population	Average Annual % Change
Denning	474	530	550	1.50
Esopus	7,605	8,350	8,550	1.18
Gardiner	3,552	4,020	4,150	1.57
Hardenburgh	280	300	300	.69
Hurley	5,992	7,430	7,430	.77
Kingston (C)	24,481	23,810	23,650	-.34
Kingston (T)	924	940	950	.28
Lloyd	7,875	8,650	8,850	1.17
Marbletown	4,956	5,500	5,650	1.32
Marlborough	7,055	7,490	7,600	.75
New Paltz	10,183	10,830	11,000	.77
Olive	3,924	4,180	4,250	.80
Plattekill	7,409	7,920	8,050	.83
Rochester	5,344	5,780	5,900	.99
Rosendale	5,933	6,110	6,150	.36
Saugerties	17,975	18,710	18,900	.50
Shandaken	2,912	3,060	3,100	.63
Shawangunk	8,186	9,570	9,950	1.97
Ulster	12,319	12,860	13,000	.54
Wawarsing	12,958	13,190	13,250	.22
Woodstock	6,823	7,040	7,100	.40
	158,158	166,270	168,450	.63

Notes: (*) Village figures are included in Town totals.
(**) Rounded to nearest 50 persons
(***) Rounded to nearest 10 persons

Source: Ulster County Planning Board Data Book Update, 1988
1980 Data is based on US Census
1990 Projections are based on UC Planning Board data

3.3 CURRENT SOLID WASTE QUANTITIES

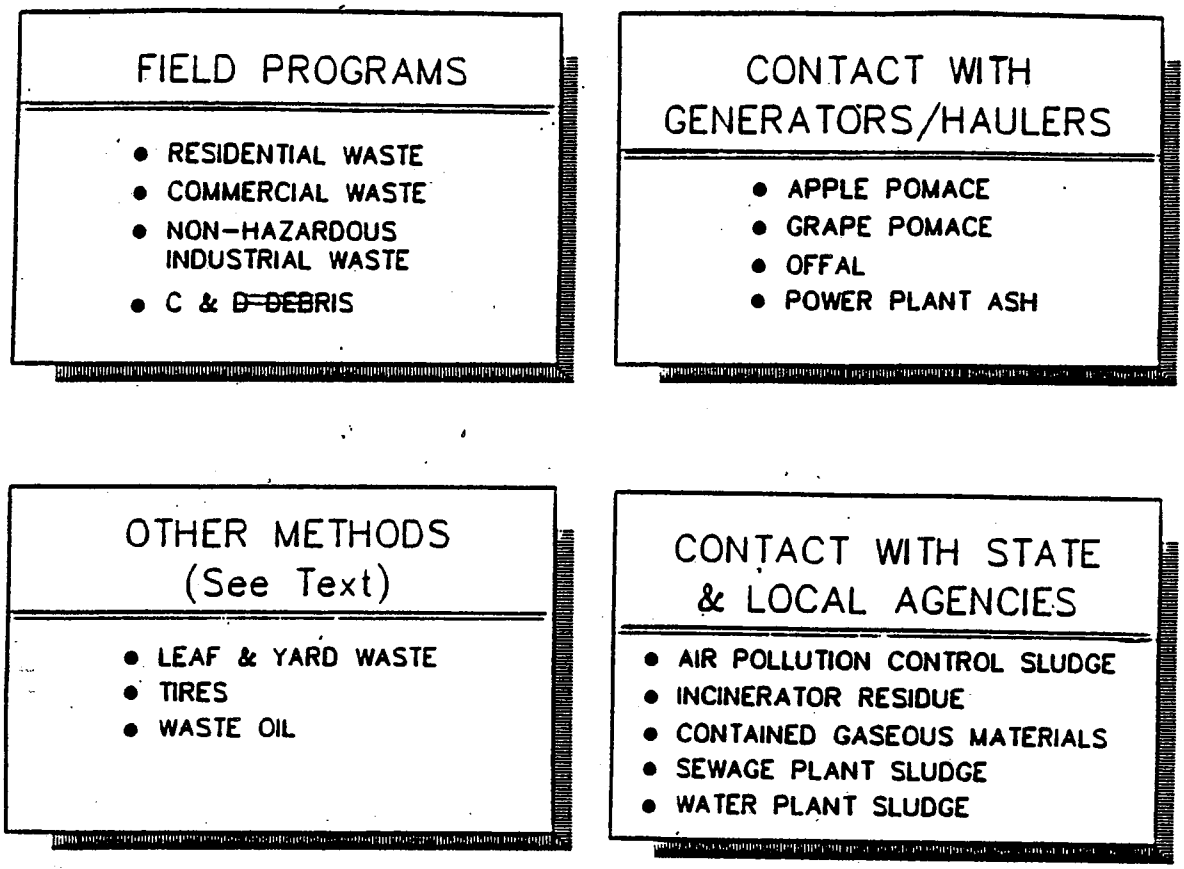
As described in Section 2.2.2 of this document (Disposal Practices), during 1988 there were 15 landfills and one transfer station operating in the County. The Jockey Hill Landfill, which was utilized by the City of

Kingston, was closed by the NYSDEC in April 1988. As of February 1988, no scales had been installed at any of these landfills. Therefore, no landfill weigh records were available. However, weigh records were available from the City of Kingston which began weighing vehicles using its transfer station facility on July 9, 1979. The Town of Ulster has subsequently installed and is operating a scale at its landfill.

In order to develop estimates of the quantity of waste being generated in the County, two field programs were conducted: a two-phase weighing program and a vehicle count. The two field programs were aimed at quantifying those wastes that are commonly landfilled. These wastes included: residential, commercial, non-hazardous industrial, C&D debris, leaf & yard wastes, waste tires, waste oil, sludge, and pomace. Of these wastes, some were generated by a specific source(s) and were quantified by contacting the waste generators rather than by recording waste disposal activity at a landfill(s). These include such wastes as pomace and sludges. Other wastes were not readily identified in the incoming waste stream at a landfill and, therefore, were more readily quantified using other methods. These included leaf and yard waste and waste oil. Tires, although easily identified, are not generated by a specific source and are subject to on-site stockpiling or exportation out-of-county, and therefore, require an alternate method of quantification other than field surveys at a landfill(s). The four wastes remaining to be quantified using the field programs were residential, commercial, non-hazardous industrial, and C&D debris. These four wastes are not generated by specific sources and may comprise entire loads of waste, and therefore were quantified using the two field programs. They represent the majority of the waste stream. This was confirmed by the results of the waste quantification programs.

Figure 3-2 outlines the methods used to quantify each of the 16 components of the County's waste stream (Note: medical wastes were not quantified under this analysis). As presented in Figure 2-2, estimates of the County's solid waste stream were developed based upon the field programs, contact with solid waste generators and haulers, contact with State and local agencies (NYSDEC, NYSDOT, and UCDOH), and contact with municipal representatives.

FIGURE 3-2
WASTE QUANTIFICATION DATA SOURCES



For a detailed discussion of the methodology used in the Waste Quantification Studies which include, the Field Programs, the Weighing Programs, the Vehicle Count Program, Residential & Commercial Waste Sampling Program, and others, the reader is referred to:

a) DGEIS, Volume I, Section 4.3, June 1989
b) DGEIS, Appendix D, Solid Waste Stream Analysis

3.3.1 WASTE QUANTITIES BY MATERIAL

Residential Waste - The residential waste component of the County's total solid waste stream, as used throughout this section, means household waste as defined in 6 NYCRR Part 360-1.2(b), and is solid waste discarded from single or multiple dwellings, hotels, motels, campsites, public and private recreation areas, ranger stations, and other residential sources. It consists of papers, plastics, textiles, glass, metals, food scraps, and a variety of other constituents. Residential waste also includes non-processible wastes such as white goods (refrigerators,

stoves, and other large metal appliances), and oversized bulky items (furniture, carpeting, and other large wastes). In accordance with 6 NYCRR Part 360-1.2(b)(77), household hazardous waste is regulated as household waste. Household hazardous waste is further discussed in Chapter 9.0 .

Commercial Waste - The commercial waste component of the County's total solid waste stream is also mixed, and consists of similar constituents to the residential waste stream. Commercial waste is defined by 6 NYCRR Part 360-1.2(b) as solid waste generated by stores, offices, restaurants, warehouses, and other non-manufacturing activities at industrial facilities. An analysis of the composition of the County's commercial waste is provided in Section 3.4.2 .

NON-HAZARDOUS INDUSTRIAL WASTE - The non-hazardous industrial wastes found in the County's solid waste stream are generated by the manufacturing and industrial processes (See 6 NYCRR Part 360-1.2(b)) typical of the County's light and heavy industry.

Construction and Demolition Debris - The C&D debris component of the County's total waste stream is mixed. 6 NYCRR Part 360 defines C&D debris as uncontaminated solid waste resulting from the construction, remodeling, repair and demolition of structures and roads, and uncontaminated solid waste consisting of vegetation resulting from land clearing and grubbing, utility line maintenance, and seasonal and storm related maintenance (see 6 NYCRR Part 360-1.2(b)). In the County, C&D debris includes such materials as bituminous road surface materials, concrete, gypsum wallboard, tile, lumber, and plumbing fixtures.

Apple Pomace - Apple pomace consists of apple skin, seed, and fruit residue created after pressing apples for juice production. A detailed analysis of pomace management in the County is provided in the DGEIS, Volume II, Appendix D-2.

The findings and conclusions of the analysis are:

- The two major sources of apple pomace in the County are Hudson Valley Apple Products in Milton and Lincoln Fruit Juices in Highland. In 1988, they generated approximately 27 tpd of apple pomace waste (LaRoach, Miller, 1988)

- Smaller, private apple processors are estimated to have generated approximately 3 tpd of additional apple pomace in 1988.

- Current disposal practices for the apple pomace waste include distributing the waste component, at no charge, to local farmers for use as a cattle feed supplement. Apple pomace has also been given to deer hunters for use as bait during hunting season.

- In addition to the total 30 tpd of apple pomace generated, an estimated additional 7 tpd of other apple processing solid wastes including fiber solids combined with diatomaceous earth, leaves, and twigs, spoiled produce, process sludge, some cardboard, and glass are currently disposed of by landfilling (LaRoach, Miller, 1988). This 7 tpd is included under the commercial waste component quantity of the County solid waste stream for 1988.

- The preferred management method for the apple pomace component of the solid waste stream is to continue to recycle or begin to compost this material.

Thirty tons per day (tpd) of apple pomace represents approximately 5 percent of the 1988 solid waste stream. For technology evaluation and siting purposes, it was assumed that apple pomace will be recycled or composted.

Grape Pomace - Grape pomace consists of grape skin, seed, and fruit residue created after pressing for wine or juice production. A detailed analysis of pomace management in the County is provided in the DGEIS, Volume II, Appendix D-2.

The findings and conclusions of this analysis are:

- The sole source of grape pomace waste in the County is the Kedem Wine Company in Milton. In 1988, approximately 2 tpd of grape pomace waste was produced there (Herzog, 1988)

- The disposal practice for the grape pomace waste is to pay for disposal at the Town of Marlborough landfill. The grape pomace is used as a cover material at the landfill. Kedem Wine Company indicated an interest in exploring the use of grape pomace as an animal feed supplement, similar to that of apple pomace.

- The preferred disposal methods for the grape pomace component of the solid waste stream is to either continue to use grape pomace as a landfill cover material, use it as an animal feed supplement for local farmers, or compost it.

Grape pomace represents less than one-half of one percent of the solid waste stream. For technology evaluation and siting purposes, it was assumed that the grape pomace will be recycled or composted.

Sewage Sludge - Sewage sludge is the mixed solid and liquid residual resulting from treatment at public water pollution control facilities. A detailed analysis of sewage sludge generation and disposal is included in Appendix D-3, DGEIS. According to this analysis, in 1988 approximately 32 tpd of sewage sludge are disposed of in the County. In 1988, approximately 3 percent of the sewage sludge generated in the County was diverted for composting. Therefore, the 1988 generation rate for sewage sludge is approximately 33 tpd. Section 9.3.7 of this document describes in detail the recommended short and long term management programs for municipal sewer treatment plant sludges.

Leaf and Yard Wastes - Leaves and yard wastes are a mixed component of the County's total waste stream consisting of leaves, grass clippings, and tree or brush trimmings. Because of the very seasonal nature of the generation of leaf and yard wastes, estimates of this waste were not determined using the weighing program. In addition, leaf and yard wastes are disposed of in backyard composting and may not be brought to the landfill for disposal. Therefore, the weighing program could not be used to develop an estimate of leaf and yard waste quantities. An estimate of the quantity of this component in the County's solid waste stream ranges from 5 to 20 percent of the waste stream (CTDEP, 1988; Cornell Cooperative Extension, 1988; NJDEP, undated; Spielman, 1988; Franklin and Associates, 1986). Using these estimates, it was assumed that the leaf and yard waste component of Ulster County's waste stream is equal to approximately 15 percent by weight of residential and commercial waste, waste oil, tires, and leaf & yard waste. This results in an estimated 1988 generation rate of leaf and yard wastes of 70 tpd.

Of the 70 tpd of leaf and yard wastes estimated to be generated in the County, it is estimated that approximately 2% is currently diverted from the waste stream through composting. Therefore, the waste disposal rate is approximately 69 tpd. Section 2.5 of this document more fully describes the waste reductions and yard waste composting generation rates since 1988.

Water Treatment Plant (WTP) Sludge - Water treatment plant (WTP) sludge is the mixed solid and liquid residual material generated from physical or chemical treatment of raw water supplies into finished drinking water. An analysis of WTP sludge generation and disposal is provided in the DGEIS, Volume II, Appendix D-3. According to this analysis, there was little or no WTP sludge generated within the County in 1988 which requires alternative disposal since existing permits allow for discharge to surface waters.

Air Pollution Control (APC) Sludge - Air pollution control sludge is a relatively source-specific waste component of the County's total waste stream. It is generated from wet air pollution control scrubbing systems removing particulate matter and, possibly, acid gas control systems.

Based on discussions with the NYSDEC, it is estimated that there is no APC sludge being landfilled in Ulster County (NYSDEC, 1988). The only coal fired plant in the County utilizes a rotary drum process, and their air pollution control sludge goes to a settling pond. Other combustion sources burn oil such as SUNY New Paltz, IBM Kingston, and the correctional facilities located within the County.

Offal - The offal component of the County's total waste stream is a relatively source-specific waste consisting of waste parts of butchered animals including fat, bones, grease, and hides. These materials are periodically collected by renderers who convert them into other marketable products. A telephone survey was conducted of four renderers who collect offal in the County. One of the renderers supplied general background information, as well as some estimates on the offal industry in the County. The following is a summary of information pertaining to offal based on these discussion (Darling Delaware, 1988).

- Approximately 2.5 million pounds of offal per year are generated in the County by resorts, hotels, motels, restaurants, butchers, and delicatessens. This equates to a generation rate of approximately four tpd.

- Offal is stored at the various generators' sites for pick-up by one of four renderers serving this market. The four renderers are Darling Delaware, Inc., of Newark, NJ; Mopac of Sauderton, PA; Western Massachusetts Rendering of Southwick, MA; and Coreneco of Tewsbury, MA.

- Renderers pay the offal generators in the County for this waste component. It has a number of uses, such as an ingredient in fertilizer, cosmetics, and tallow for soap.

- It does not appear that offal enters the County solid waste stream for disposal since this waste component is reused in other industries.

It is recommended that the estimated 4 tpd of offal generated in the County in 1988 continue to be recycled as an ingredient for secondary manufacturing products or be composted if the present management practices cease.

Incinerator Residue - Incinerator residue is a relatively source-specific waste component of the County's total waste stream consisting of combustion ash and the non-combustible fraction of solid waste or other fuels burned in an incinerator. However, based on contact with the NYSDEC, there are no incinerators in the County producing ash residues (Isabelle, 1988). Residential sources of incinerator residue include wood stoves, fireplaces, and facilities that burn solid waste on-site. No such residue was seen entering the waste stream during the weighing programs. As such, the generation rate of ash residue in Ulster County is nominal, and the disposal rate is assumed to be zero. Small quantities that are produced in residence are included with the residential component of the solid waste stream.

Tires - An analysis of waste tire management in the County is provided in DGEIS, Volume II, Appendix D-4. As this analysis indicates, it is estimated that approximately 166,000 waste tires were generated in the County in 1988. This estimate is based on the assumption that one tire is disposed per person per year. At an average weight of 21 pounds per tire, the amount of waste tires generated in the County is approximately 5 tpd. During 1988, no significant recycling or reuse of waste tires occurred in the County.

Waste Oil - The waste oil component of the County's waste stream is the spent oil from automotive engines and industrial plant machinery. Based on contact with the New York State Office of Public Works, as of the most

recent complete data, there were 136,429 vehicles registered in the County in 1986 (Valodes, 1988). Using a conservatively high estimate of 20 quarts of waste oil per vehicle per year to account for larger vehicles and waste oil from additional sources, approximately 35 pounds of waste oil are estimated to be generated annually by each vehicle (approximately 7 tpd Countywide).

Based upon information provided in the Recycling Action Plan, Volume IV (RAP) of the DGEIS, it is estimated that approximately one-half of this solid waste stream component was recycled in 1988. Existing waste oil recycling centers in the County are capable of collecting and storing the waste oil for future reprocessing. As such, the 1988 waste disposal rate for waste oil was approximately 4 tpd.

Contained Gaseous Material - Contained gaseous material is the compressed gas cylinders and bottles used for storage of gases such as propane, acetylene, oxygen, carbon dioxide, and others.

Compressed gas bottles are typically reused and have a 20 to 30 year life. During the life of a container, it is inspected periodically in accordance with Department of Transportation (DOT) specifications. All containers which fail inspection are stored on-site until a DOT certified bottle re-builder picks them up. These companies either rebuild the bottles or sell them for scrap.

Based on this information, it is assumed that no significant amounts of compressed gas bottles or cylinders are disposed of in the County by gas suppliers.

Power Plant Ash - Power plant ash consists of fossil fuel combustion ash and flyash from electric utility power plants.

Two electric utilities serve the County: New York State Electric & Gas Company (NYSE&G) and Central Hudson Gas & Electric Corporation (CHG&E). NYSE&G's service area is limited to the extreme western portion of the County and NYSE&G does not have any power plants in the County. CHG&E serves the remaining areas of the County which include the majority of the County's population. However, CHG&E has no fossil fuel power plants in the County. Therefore, no fossil fuel power plant ash is being generated in the County. In addition, CHG&E indicates that no power plant ash from CHG&E fossil fuel power plants outside of the County is being imported for disposal in the County.

3.3.2 SUMMARY OF WASTE QUANTITIES

Table 3-5 presents the estimated 1988 generation rate for each of the County's 16 solid waste stream components (medical waste is included in residential and commercial waste). The field programs used to quantify residential, commercial, non-hazardous industrial, and C&D wastes, resulted in the average 1988 daily waste disposal rate for each of these components. This is the rate at which these wastes are disposed after recycling. In order to calculate the 1988 generation rate for these wastes, the 1988 recycling rates, reported in the DGEIS, Volume IV Recycling Action Plan (RAP), Section 3.0 were used to determine the total waste quantities.

As reported in the RAP, approximately 5% of the total 1988 solid waste stream, exclusive of sludge, was reduced through the returnable container law (RCL). An additional 0.7% of this same waste stream was recycled through various municipal recycling programs. This total 5.7% of the 1988 total solid waste stream, exclusive of sludge, is equal to approximately 15% by weight of the residential waste stream. Also, approximately 2% of the total 1988 solid waste stream, exclusive of sludge, was recycled through commercial recycling programs in 1988. This is equal to approximately 8% by weight of the commercial waste stream.

In addition, about 0.3% of the 1988 total solid waste stream, excluding sludge, consisted of composted leaf and yard waste. This equals 2% of leaf and yard wastes and composted sewage sludge which is 3% by weight of the sewage sludge waste component. The total 1988 solid waste stream, exclusive of sludges, includes residential, commercial and non-hazardous industrial waste, apple and grape pomace, C&D debris, leaf and yard wastes, offal, tires, and waste oil. As presented in Table 3-5, the total estimated waste generation rate is 645 tpd or 7.8 pounds per capita per day for the 16 components of the County's waste stream. Table 3-5 also presents an estimate of the 1988 processible waste generation rate by solid waste stream components.

3.3.3 COMPARISON OF WASTE QUANTITIES

Table 3-6 presents a comparison of the County's 1988 waste generation rate of 7.8 pounds per capita per day with the waste generation rates of seven other locations and lists the components included in the estimates for each respective waste stream.

TABLE 3-5

1988 ULSTER COUNTY SOLID WASTE STREAM QUANTITIES BY COMPONENT

Solid Waste Stream Component	Estimated Waste Generation Rate (tpd)	Percent of Waste Diverted From Total (3)	Waste Disposal Rate (tpd)	Non-Processable Percent of Waste Component	Processable Waste Generation Rate (tpd) (4)
Residential Waste (1)	227	15%	193	5%	182
Commercial Waste	157	8%	146	3%	152
Non-Hazardous Industrial Waste	55	0%	55	3%	53
Apple Pomace	30	100%	0	NA	NA
Grape Pomace	2	100%	0	NA	NA
Construction and Demolition Debris	55	0%	55	75%	14
Sewage Plant Sludge (g)	33	3%	32	0%	32
Leaves and Yard Waste	70	2%	69	0%	69
Water Plant Sludge	(2)	NA	NA	NA	NA
Air Pollution Control Facility Sludge	0	NA	NA	NA	NA
Offal	4	100%	0	NA	0
Incinerator Residue	0	NA	0	NA	0
Tires	5	0%	5	0%	5
Waste Oil	7	50%	4	0%	4
Contained Gaseous Material	0	NA	0	NA	0
Power Plant Ash	0	NA	0	NA	0
Total Solid Waste Stream	645 tpd 7.8 lbs/cap/day	14%	557	8%	511
Less Sludge	33 tpd				
Waste for projection including sludge	612 tpd 7.3 lbs/cap/day				

Notes:

(1) Approximately 5 percent of residential waste is estimated to be bulky wastes and white goods, and therefore, non-processable.

(2) Estimates of water plant sludge quantities requiring disposal in 1988 are negligible (see Appendix C-3).

(3) Recycling percentages are based on numbers developed in the RAP and can be summarized as follows:
Residential Waste - Approximately 5 percent of the 1988 solid waste stream (exclusive of sludge) was recycled through the Returnable Container Law (RCL). An additional 0.7 percent of the total 1988 solid waste stream (exclusive of sludge) was recycled through municipal recycling programs. This equals approximately 15 percent by weight of the 1988 residential waste stream.
Commercial Waste - Approximately 2 percent of the 1988 solid waste stream (exclusive of sludge) was recycled through commercial recycling programs. This equals approximately eight percent, by weight, of the 1988 commercial waste stream.
Leaf and Yard Waste - Approximately 0.3 percent of the 1988 solid waste stream (exclusive of sludge) was composted leaf and yard waste. This equals approximately two percent by weight of the 1988 leaf and waste component.
Sewage Sludge - Approximately 0.2 percent of the 1988 solid waste stream consisted of composted sewage sludge. This equals approximately three percent by weight of the 1988 sewage sludge waste component.
Apple and Grape Pomace - It is estimated that all of the apple and grape pomace generated in 1988 is reused.

(4) Processable waste generation is based on the percentage of non-processables of the waste generation rate, not of the waste disposal rate.

TABLE 3-6

COMPARISON OF WASTE GENERATION RATES

Ulster County Waste Stream Components	Ulster County Waste Generation Rate (PCD) (1988)	Putnam County(1) (1988)	North Hempstead(2) (1985)	Franklin Associates(3) (1984)	Bergen County(4) (1987)	Waterbury(5) (1986)	Westchester County(6) (1987)	New York State(7) (1987)
			(Waste Stream Components Included in Total)					
Residential	2.74	X	X	X	X	X	X	X
Commercial	1.89	X	X	X	X	X	X	X
Industrial	0.66		X	X	X	X	X	
Apple Pomace	0.36							
Grape Pomace	0.02							
C & D Debris	0.66		X	X	X	X	X	X
Sewage Sludge	0.40	X	X			X		
Leaf & Yard Wastes	0.84	X	X	X		X	X	X
Offal	0.05							
Tires	0.06		X	X	X	X	X	
Waste Oil	0.08		X	X		X	X	
Total (pcd)	7.8	5.70	8.22	5.89	5.21	6.34	6.15	5.60
1988 Total (pcd)(8)	7.8	5.70	8.46	6.50	5.26	6.40	6.21	5.70
Ulster Adjusted Total (pcd)(9)	6.93	5.87	6.93	7.33	6.01	6.93	6.88	6.53
Percent Difference		+3%	-19%	+13%	+14%	+8%	+11%	+15%

Notes:

(1) Putnam County, New York, Solid Waste Management Plan, Draft Generic Environmental Impact Statement. William F. Cosulich Associates, P.C., December 1988.

(2) North Hempstead Draft Site and Technology Specific Addendum to the Generic Environmental Impact Statement, Malcolm Pirnie, Inc., 1987.

(3) Characterization of Municipal Solid Waste in the United States, 1960 to 2000. Final Report. Franklin and Associates, July 1986.

(4) Recycling/Waste Composition Study Prepared for the Bergen County Utilities Authority. Malcolm Pirnie, Inc., August 1987.

(5) Plan for Recycling Program Development, City of Waterbury, Connecticut. Malcolm Pirnie, Inc., September 1987.

(6) Solid Waste Management Plan - Phase II Final Report. Prepared for Westchester County Department of Public Works, Solid Waste Management Division. Malcolm Pirnie, Inc., May 1988.

(7) New York State Solid Waste Management Plan Update. NYSDEC, 1987.

(8) All values determined prior to 1988 were increased at a rate of 1.0 percent annually to estimate 1988 values for comparison.

(9) Ulster County's total was recalculated for each case based on the composition of the comparative waste stream.

Care was taken to ensure that the waste stream components in the comparison were the same. The waste generation rate for other municipalities was increased by 1% per year to update it to the 1988 study year. These adjustments were made to allow for equitable comparisons. Some of the data from other locations does not clearly indicate whether the reported data is a waste generation rate or a waste disposal rate (after recycling) and do not list specific components of the waste stream. Where data sources do not specifically list which type of wastes are included in the residential waste stream, components such as waste oil and leaf and yard wastes are assumed to be included. As shown in Table 3-6, with the exception of the comparison with North Hempstead, NY, the waste quantities for the County appear to be somewhat higher, between 3 and 15 percent, than generation rates for the other communities and sources listed.

One reason that the Ulster County waste generation rates are high in comparison to other locations may be that in calculating the waste quantities for the County, the procedures used to extrapolate the weighing program data to annual countywide data incorporated a significant level of conservatism. Another possibility is that the actual growth in waste generation rates has been considerably higher than one percent per year in the past few years. This possible explanation is supported by a recent statement reported by NYSDEC that between 1986 and 1988 the growth in the NY State municipal waste stream disposed was from 17,271,835 tons to 20,165,279 tons, or approximately 17 percent, with a corresponding growth in population estimated at a much lower 0.3 percent (Nosenchuck, 1988). However, it should be noted that improved reporting of waste disposal activity may have contributed to an increase in reported tonnages (Nosenchuck, 1988). A third possibility is that the data extrapolated from the weighing program is, in fact, accurate. For the purposes of this DGEIS, the data presented in Table 3-6 has been assumed to be representative of the 1988 Ulster County solid waste stream. This assumption, although it may appear to be conservative, is prudent. In the development of any public works project required to maintain and ensure public health, such as a sewage treatment plant, a water supply system, or a waste disposal facility, it is important that the project have the capacity necessary to serve its intended purpose. In developing such projects, it is important not to undersize the capacity of a facility. In the event a facility were undersized, it

would require that additional measures be taken to supplement the facility at additional cost to the public, and potentially some risk of a decrease in maintaining accepted public health standards due to an emergency condition. In addition, developing estimates of waste quantities to the conservative side results in a facility which will continue to serve its purpose for the planning period and may even afford the opportunity to extend that period of performance.

3.4 WASTE COMPOSITION

3.4.1 WASTE COMPOSITION - SAMPLING METHOD

An assessment of the composition of the commercial and residential waste stream is necessary for the development of the recycling plan. The quantities as a percent by weight of the total solid waste stream component of such constituents, such as paper, glass, and metal, are used to determine recycling potential. In addition, this data is used to estimate the impact recycling has on the projected waste stream, an important consideration when developing quantities of waste requiring disposal.

To develop a profile of the composition of the County's residential and commercial waste streams, UCRRA's consultants conducted two one-week solid waste sampling programs in February and July concurrent with the Phase I and Phase II weighing programs described on page 3-8. During each week, a number of representative samples of waste were taken from trucks dumping at the Town of Saugerties landfill. In Phase I sampling program, seven residential waste samples and six commercial waste samples were analyzed. In Phase II sampling program, 11 residential waste samples and 3 commercial waste samples were analyzed. Although it was intended to sample an equal number of residential and commercial loads during Phase II of the sampling program, vehicles using the Town of Saugerties landfill during the week of July 25 to July 29, 1989, for the most part, did not carry unmixed commercial loads, but rather, carried residential loads and mixed residential/commercial loads. Of the 107 vehicles weighed, only 3 carried unmixed commercial waste while 20 carried mixed residential and commercial loads. In order to obtain a sample that was representative of both commercial or residential waste, the load from which the sample was taken had to be comprised solely of either waste type and not mixed.

The residential and commercial samples were separated into 22 waste stream types. The total weight of each sample and individual weights for each type were recorded. The percent of weight by type was then calculated. The 22 waste types used were as follows:

WASTE TYPES USED IN SAMPLING

Newspaper
Corrugated Paper
Mixed Paper
Other Paper
Plastic Beverage Containers
Plastic Milk Bottles
Other Plastics
Plastic Film
Aluminum Cans
Other Aluminum
Ferrous Scrap
Tin Cans
Textiles/Fabrics
Food Waste
Container Glass
Other Glass
Wood
Dirt and Debris
Ceramics and Fines
Rubber
Leather
Miscellaneous

Most of these represent waste types that can be sorted out of the waste stream and may have either existing recycling markets or potential markets. However, every item within a specific type may not be recyclable. Therefore, the percent of the total waste stream of each type that can be recycled represents a theoretical recyclable quantity. Of this quantity, some portion may not be physically suitable for recycling. It must be noted that recycling is influenced by market availability, separation efficiencies, and participation rates. (There will be further discussion of separation efficiencies and participation rates in sections that follow.)

In addition to sorting the waste, a representative portion of each sample was taken for laboratory analysis. Two analyses were performed: 1) **Proximate analysis** (percent by weight of moisture, ash, volatiles, and fixed carbon); and 2) **Ultimate analysis** (carbon, hydrogen, nitrogen, oxygen, sulfur, and chlorine). In addition, an estimate of higher heating value which is a measure of the solid waste's energy content was determined for each sample. Appendix D.5 of the DGEIS contains additional details of the residential/commercial sampling programs and associated analysis.

3.4.2 RESIDENTIAL AND COMMERCIAL WASTE COMPOSITION

Table 3-7 presents the general composition of the County's residential and commercial waste stream, according to the 22 waste stream types identified in the

sampling program. Table 3-7 also gives an estimate (in "% by weight") of how much of each waste type comprises either the residential or commercial waste stream component. (It should be noted that "% by weight" does not represent percent by weight of the total waste stream, but rather percent by weight of the total residential component or total commercial component.)

TABLE 3-7

RESIDENTIAL AND COMMERCIAL WASTE COMPOSITION*
(% by weight)**

Waste Stream	Residential	Commercial
Newspaper	10	4
Corrugated Paper	1	16
Mixed Paper	1	8
Other Paper	33	30
Plastic Beverage Containers	<1	<1
Plastics Milk Bottles	<1	<1
Other Plastics	4	5
Plastic Film	6	6
Aluminum Cans	<1	1
Other Aluminum	1	<1
Ferrous Scrap	1	4
Tin Cans	5	1
Textiles/Fabrics	4	1
Food Waste	20	9
Container Glass	10	8
Other Glass	<1	<1
Wood	<1	2
Dirt and Debris	3	2
Ceramics and Fines	1	<1
Rubber	<1	<1
Leather	<1	0
Miscellaneous	<1	2
	100%	100%

Note: * Based on February & July 1988 Waste sampling at Town of Saugerties landfill

** % by weight of total residential or total commercial component, not % of total waste stream

*** Leaf and yard wastes and waste oil have been excluded and quantified separately

Table 3-8 presents a comparison of the amount (in tons per day (tpd)) of different residential and commercial waste streams. It also presents a total amount (in tpd) of the combined residential and commercial waste types. This Table was developed by multiplying the "% by weight" figures from Table 3-7 times the total residential (227 tpd) and total commercial (157 tpd) waste stream component figures found in Table 3-5. The data contained in Table 3-8 will allow UCRRA to evaluate and track the amount of residential and commercial waste that can be diverted or be made available for recycling.

Table 3-8

Comparison of Residential & Commercial Waste Composition (Tons Per Day)

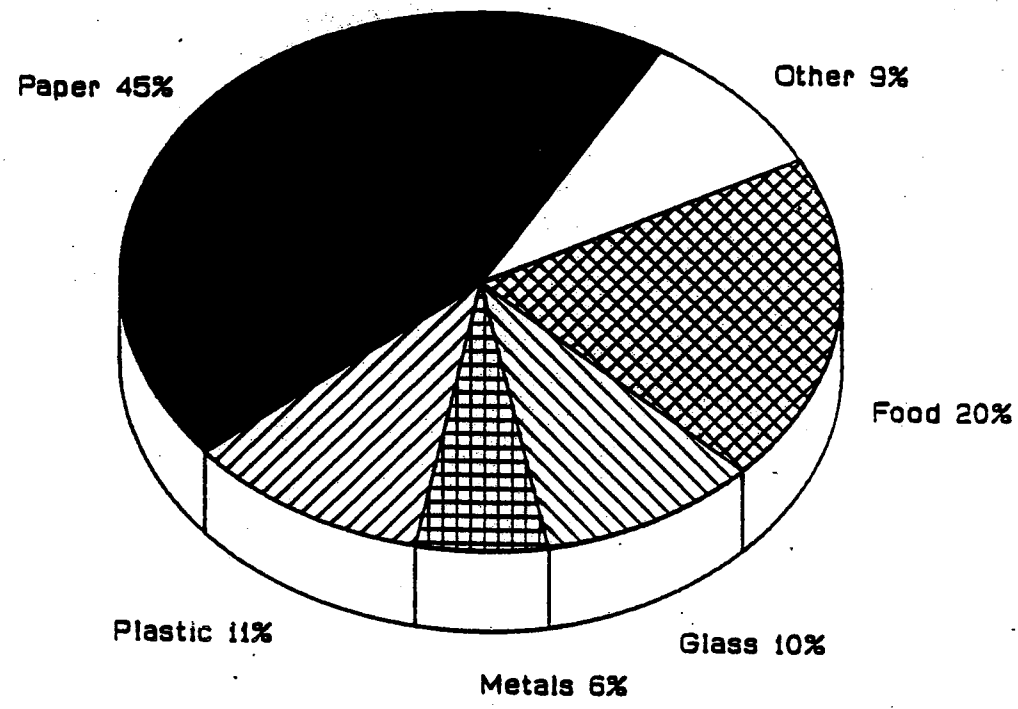
WASTE STREAM	Residential (TPD)	Commercial (TPD)	Combined Residential & Commercial (TPD)	Percent of Waste Stream
Newspaper	21.906	5.809	27.7	4.3%
Corrugated Cardboard	3.223	24.414	27.6	4.3%
Mixed Paper	1.657	12.497	14.2	2.2%
Other Paper	74.683	46.723	121.4	18.8%
Plastic Bev. Containers	0.636	0.550	1.2	0.2%
Plastic Milk Bottles	0.999	0.141	1.1	0.2%
Other Plastic	9.784	8.305	18.1	2.8%
Plastic Film	12.939	9.137	22.1	3.4%
Aluminum Cans	0.295	0.911	1.2	0.2%
Other Aluminum	1.226	0.471	1.7	0.3%
Ferrous Scrap	1.725	5.699	7.4	1.2%
Tin Cans	10.510	1.900	12.4	1.9%
Textiles/Fabrics	9.557	0.848	10.4	1.6%
Food Waste	44.288	14.727	59.0	9.1%
Container Glass	22.382	13.267	35.6	5.5%
Other Glass	0.114	0.236	0.4	<0.1%
Wood	0.068	3.423	3.5	0.5%
Dirt & Debris	6.742	3.124	9.9	1.5%
Ceramics & Fines	2.815	0.722	3.5	0.5%
Rubber	0.477	0.298	0.8	0.1%
Leather	0.318	0.000	0.3	<0.1%
Miscellaneous	0.658	3.799	4.5	0.7%
Total Waste Stream	227.000	157.000	384.0	59.5%

- Figures 3-3 and 3-4 graphically present the composition of the County's residential and commercial waste streams, respectively. The Figures group the 22 waste types into six major categories: **paper, plastic, food, metals, glass, and other**; and give the approximate percent by weight of each category.

- Table 3-9 presents a summary of the Proximate and Ultimate Analysis of the residential and commercial waste samples. A discussion of the methodology and more detailed results of these analyses can be found in the DGEIS, Volume II, Appendix D.5.

RESIDENTIAL WASTE STREAM COMPOSITION

% by weight



COMMERCIAL WASTE STREAM COMPOSITION

% by weight

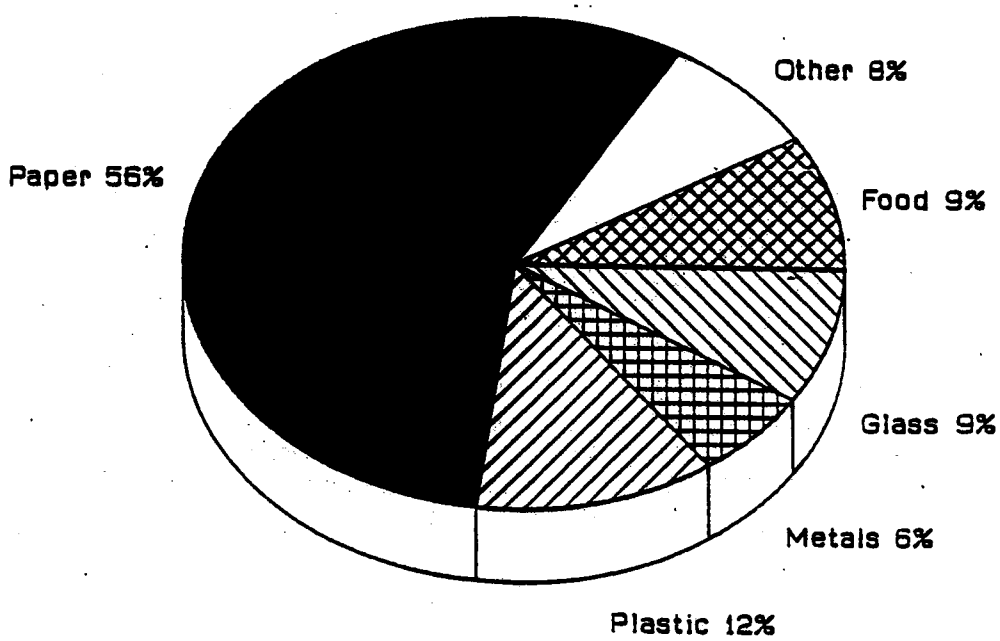
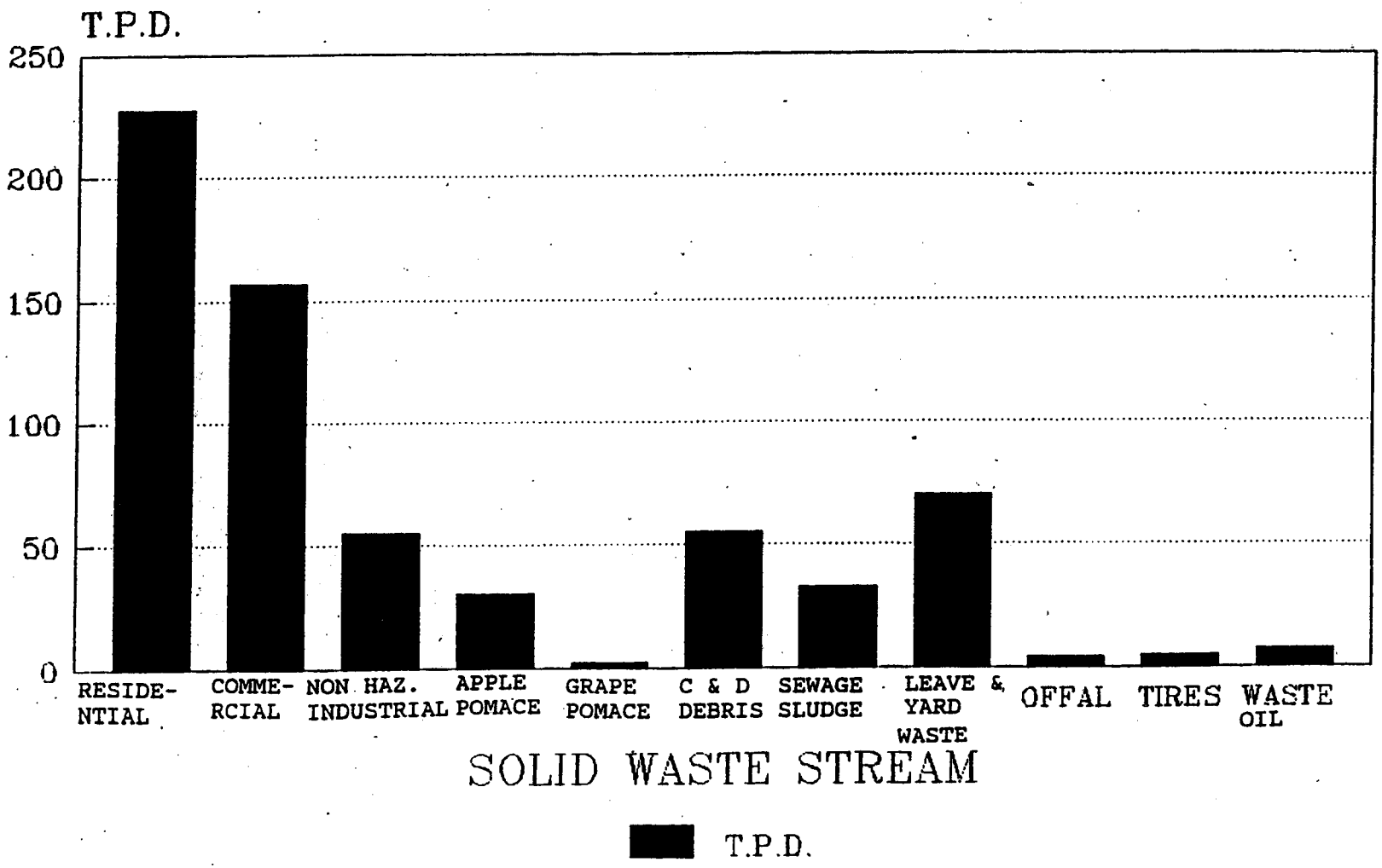


FIGURE 3-4

U.C. SOLID WASTE STREAM

EST. WASTE TONS PER DAY



EST. FROM 1988 FIGURES

- **The Chart** below presents an average estimate of the higher heating value of the residential and commercial waste stream in the County. A further discussion of the method used to obtain this data can be found in DGEIS, Appendix D.5.

SUMMARY OF THE AVERAGE HIGHER HEATING VALUE (HHV) OF RESIDENTIAL AND COMMERCIAL WASTE SAMPLES*

	Residential Waste	Commercial Waste
February	5,060	6,154
July	4,948	4,657

* I Btu/lb

TABLE 3-9

SUMMARY OF PROXIMATE AND ULTIMATE ANALYSIS OF RESIDENTIAL AND COMMERCIAL WASTE SAMPLES (1)

Proximate Analysis (2)

	Residential Waste				Commercial Waste			
	As Received Basis		Dry Weight Basis		As Received Basis		Dry Weight Basis	
	February	July	February	July	February	July	February	July
	(Average %)		(Average %)		(Average %)		(Average %)	
Ash	6.38	4.67	7.37	6.27	4.37	2.41	5.37	2.41
Volatile	69.09	60.82	80.15	81.07	66.24	60.50	81.53	60.50
Fixed Carbon	10.76	9.47	12.48	12.66	10.63	9.81	13.11	9.81
Moisture	13.76	25.03	-	-	18.76	27.28	-	-

Ultimate Analysis (2)

	Residential Waste				Commercial Waste			
	As Received Basis		Dry Weight Basis		As Received Basis		Dry Weight Basis	
	February	July	February	July	February	July	February	July
	(Average %)		(Average %)		(Average %)		(Average %)	
Carbon	39.71	35.20	46.07	43.88	39.13	31.05	48.14	46.35
Hydrogen	5.36	4.98	6.22	6.70	5.21	4.26	6.41	6.34
Nitrogen	0.23	0.17	0.27	0.19	0.25	0.21	0.31	0.32
Oxygen	29.56	57.14	34.34	40.56	27.50	28.21	33.25	41.74
Sulfur	0.05	0.07	0.06	0.09	0.05	0.07	0.06	0.14
Chlorine	0.21	0.77	0.24	1.11	0.47	0.59	0.54	0.88

Notes: (1) Based on Phase I and Phase II waste sampling programs conducted at the Town of Saugerties Landfill, February 8 to 12, 1988 and July 25 to 29, 1988.
(2) Performed by Gould Energy, Fuel Engineering Division, Thornwood, NY.

3.4.3 COMPARISON OF RESIDENTIAL AND COMMERCIAL WASTE COMPOSITION

Table 3-10 presents a comparison of the County's combined commercial and residential waste composition with the commercial and residential waste in other locations. According to this comparison, the County falls within the range presented for most components of the waste stream. However, the percentage of paper, plastics, and food wastes exceeds the expected range of values. What appears to be increased percentages of plastics may reflect the recent growth in the generation of this type of waste nationwide. What appears to be increased percentage of food waste may be the result of aggressive recycling of other constituents of the residential waste stream thereby reducing the total residential waste of which food waste is a part. A more detailed comparison of residential and commercial waste composition, including seasonal fluctuations within the waste stream and the reasons for such fluctuations can be found in the DGEIS, Volume II, Appendix D-2 and D-5.

TABLE 3-10

COMPARISON OF ULSTER COUNTY'S WASTE STREAM TO OTHER LOCATIONS
(percent by weight)

Material	Ulster County	Broward(1) County CDL	Broward(1) County Davie	(2) Franklin Associates	(3) York County	Town of North Hempstead (4) Summer 1985	Town of North Hempstead (4) Fall 1985	Average	Range
Paper & OCC	49.7	35.5	46.2	45.2	43.7	42.7	46.0	43.2	35.5-46.2
Plastics	11.1	6.6	8.9	8.8	4.6	8.0	6.8	7.3	4.6 -8.9
Metals	5.8	6.0	5.1	11.7	7.0	5.1	5.9	6.9	5.1-11.7
Glass	9.4	9.3	6.4	11.8	12.2	9.6	9.7	9.8	6.4-12.2
Food Waste	15.4	6.6	7.7	9.9	11.6	11.7	10.6	9.7	6.6-11.7
Wood	0.9	10.5	16.7	4.6	0.1	11.5	14.3	9.6	0.1-16.7
Textiles, rubber and Leather	3.0	2.6	6.4	5.7	2.7	0.7	1.0	3.2	0.7- 6.4
Other	4.7	22.3	2.6	2.3	18.1	10.7	5.7	7.0	2.3-22.3

Notes: (1) Request for proposals for full service solid waste disposal for Broward County, Florida, Malcolm Pirnie, Inc., September 1984

CDL = Central Disposal Facility Landfill located in Pompano Beach, Florida
Davie= Broward County Landfill in Davie, Florida

(2) Characterization of Municipal Solid Waste in the US - 1960 to 2000 Final Report, Franklin Associates, LTD, July 11, 1986

(3) York County Solid Waste Management Plan Update, Preliminary Final Report, Malcolm Pirnie , August 1985

(4) Preliminary Description and criteria outline for the North Hempstead Solid Waste Management Facility Project, December 1985

3.5 WASTE STREAM PROJECTIONS

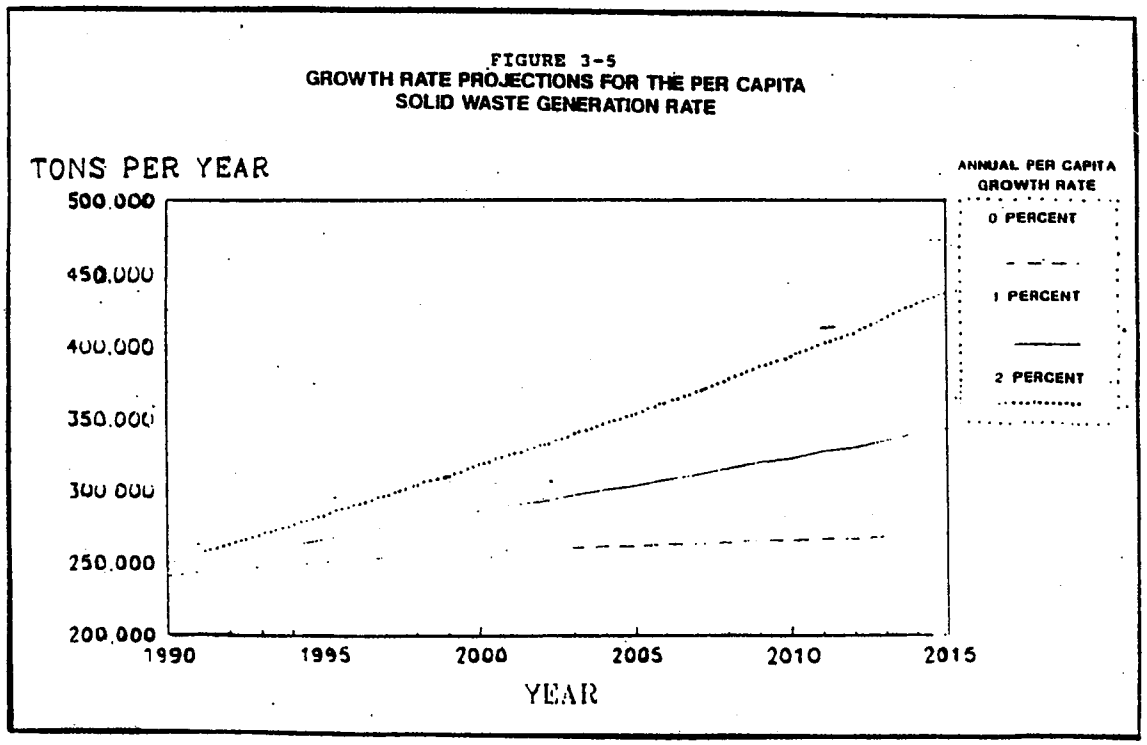
To determine quantities of solid waste requiring processing and disposal over the 20 year planning period (1994-2014), the 1988 estimate of 645 tpd (see Table 3-5) was projected through the year 2014. This projection was dependent upon two factors:

- o Population growth
- o Per capita waste generation rates

Note: Each of the 16 waste stream components listed in Table 3-5 were assessed in terms of the potential for growth with either one or both of these factors. All components, excluding apple and grape pomace, were assumed to increase proportionately with population. Apple and grape pomace quantities were kept constant over the planning period. It was not expected that apple or grape pomace production would increase. In fact, it may decrease due to the decline in total number of commercial farms in the County. To provide for a conservative estimate, it was assumed that the quantity of apple and grape pomace would remain constant over the planning period.

It is expected that there will be some increase in waste generation resulting directly from population increases. In addition, it was estimated that waste generation would rise because of an increase from 0-2% in the per capita generation (Franklin and Associates, 1986; Malcolm Pirnie, Inc. 1988, 1987; William F. Cosulich and Associates, 1988). The reasons for this higher per capita waste generation include: increase in individual purchasing power, increase in reliance on convenience foods, and increase in the use of packaging materials (Franklin and Associates, 1986). Figure 3-5 presents waste projections over this range.

FIGURE 3-5
GROWTH RATE PROJECTIONS FOR THE PER CAPITA
SOLID WASTE GENERATION RATE



For the purpose of this analysis, an annual increase of 1% of the per capita generation rate was used for the following five waste stream components: residential, commercial, non-hazardous industrial, and construction and demolition debris. Growth in water treatment plant sludge and sewage sludge was determined based on population growth and estimates of increase in the number of people served by central water and sewer systems, and is more fully discussed in DGEIS, Appendices D-3 and C-5.

Table 3-11 provides the estimated and projected generation rates in tpd for each of the 12 solid waste stream components expected to increase. The projections were given for the years 1988, 1990, 1997, 2000, 2004, 2010, and 2014. These years were identified as being significant for the following reasons:

- 1988 is the year of the waste quantification study
- 1990, 2000, and 2010 are the decades that are included in the planning period
- 1997 is the year that NYS recycling goals must be met
- 2004 is the technology design year
- 2014 is the last year in the planning period

TABLE 3-11

ESTIMATED AND PROJECTED GENERATION RATES BY SOLID WASTE COMPONENT (1)

Ulster County Solid Waste Stream Component	Tons per Day							
	1988	1990	1994	1997	2000	2004	2010	2014
Residential	227	232	244	239	258	268	281	290
Commercial	157	160	168	165	179	185	194	200
Non-Hazardous Industrial	55	56	59	58	63	65	68	71
Construction & Demolition	55	57	60	61	66	70	76	80
Leaf & Yard Waste	70	71	74	71	75	76	78	79
Tires	5	5	5	6	6	6	6	6
Sewage Treatment Plant Sludge	33	41	43	46	51	51	52	52
Water Treatment Plant Sludge(2)	-	-	-	4	4	4	4	4
Waste Oil	7	7	7	8	8	8	9	9
Apple Pomace	30	30	30	30	30	30	30	30
Grape Pomace	2	2	2	2	2	2	2	2
Offal	4	4	4	4	4	4	4	4
Subtotal:	645	665	696	693	746	770	803	827
Waste Reduction Excluding Returnable Beverage Container Law	0	6	22	58	40	56	82	102
Total:	645	672	718	751	786	827	886	929

(1) Columns may not add due to rounding.
(2) Water Treatment Plant Sludge production is assumed to begin in 1997.

3.6 WASTE REDUCTION AND RECYCLING QUANTITIES AND PROJECTIONS

3.6.1 WASTE REDUCTION

The term "waste reduction" means decreasing the amount of materials which would eventually enter the solid waste stream. Waste reduction efforts can result in either lowering the rate of growth of the waste stream, or if waste reduction is greater than the rate of growth, decreasing the quantities of waste generated over time.

Waste reduction generally would occur before materials enter the waste stream. Some examples of waste reduction practices include changing the way goods are manufactured and packaged to reduce the waste associated with each product or diverting to reuse materials which are currently discarded. A full discussion of the County's waste reduction program can be found in Chapter 9.3.1 of this document.

Waste reduction is given the highest priority in the NYS solid waste management hierarchy, and its generally recognized that effective implementation will require state and possibly federal legislation. Based on the State Solid Waste Management Plan (the State Plan), the following legislative proposals have been recommended for the implementation of waste reduction:

- Expansion of the scope of the State Returnable Container Law (RCL)

- Establishment of Standards for packaging sold in New York State.

- A waste initiator's fee on packaging sold in New York State, with higher fees assessed for non-recyclable packaging.

Since it is estimated that approximately one-third of the State's waste stream is comprised of packaging materials (NYSDEC, 1987), the State has set a goal of attaining 8-10% reduction in the volume of waste by the year 1997. For the County, it was assumed that the total solid waste stream generated would be reduced approximately 10% by 1997. Of this amount, approximately 5% represents the current rate of waste reduction via the RCL, and another 4-5% through packaging reduction, education, and certain waste reduction measures implemented by the Federal or State government. In addition, it may be appropriate for the County to implement its own legislation to initiate further waste reduction measures. A discussion of planned activities for the County is provided in Section 9.3.1 of this document.

3.6.2 RECYCLING QUANTITIES AND PROJECTIONS

The term "recycling" is defined as the reuse or processing of materials that are separated from the waste stream. Recyclable materials include portions of the following waste stream components: paper, cans, plastic, metals, waste oil, rubber, leaf and yard waste, C&D waste, and tires. Many of these materials can be recycled as raw materials for manufacturing processes.

Recycling is given high priority in the State's solid waste management hierarchy. The State's goal is to reduce/recycle 50% of the solid waste generated in New York State by 1997 (NYSDEC, 1987). UCRRA's goal is to maximize recycling, achieving greater percentages of recycled materials than the State's goal. During 1988, approximately 4% of the state waste stream was recycled. In 1988, Ulster County recycled approximately 8% of its waste stream. That figure rose to about 10% in 1989 and 13% in 1990, and is expected to reach 20-25% in 1991. Achievement of the goal of maximizing recycling can only be realized through a combined effort on the part of the public, State and local governments, and the private sector.

As described in Chapter 9.0 of this document and the DGEIS, Volume IV, Recycling Action Plan (RAP), the recycling program for the County is an aggressive one designed to maximize to the extent economically and technically practical, waste reduction, recycling and reuse of all components of the waste stream within its service area. It is recognized that the State's goal of 50% reduction/recycling is used as a planning objective by the State, for the entire state. But the County's plan is an aggressive one which will meet and exceed the State's planning objective.

Figures 3-6 and 9-1C depict the County's projected recycling and reduction percentages for the year 1997. Figures 3-7 and 3-8 present projections of the solid waste stream, waste reduction, and recycling and reuse over the planning period (1994-2014) based on the proposed recycling plan. Figure 3-9 depicts the planned growth of recycling in the County for the period 1990 through 2000.

PROJECTED RECYCLING AND WASTE REDUCTION AS A PERCENT OF THE WASTE STREAM (2)

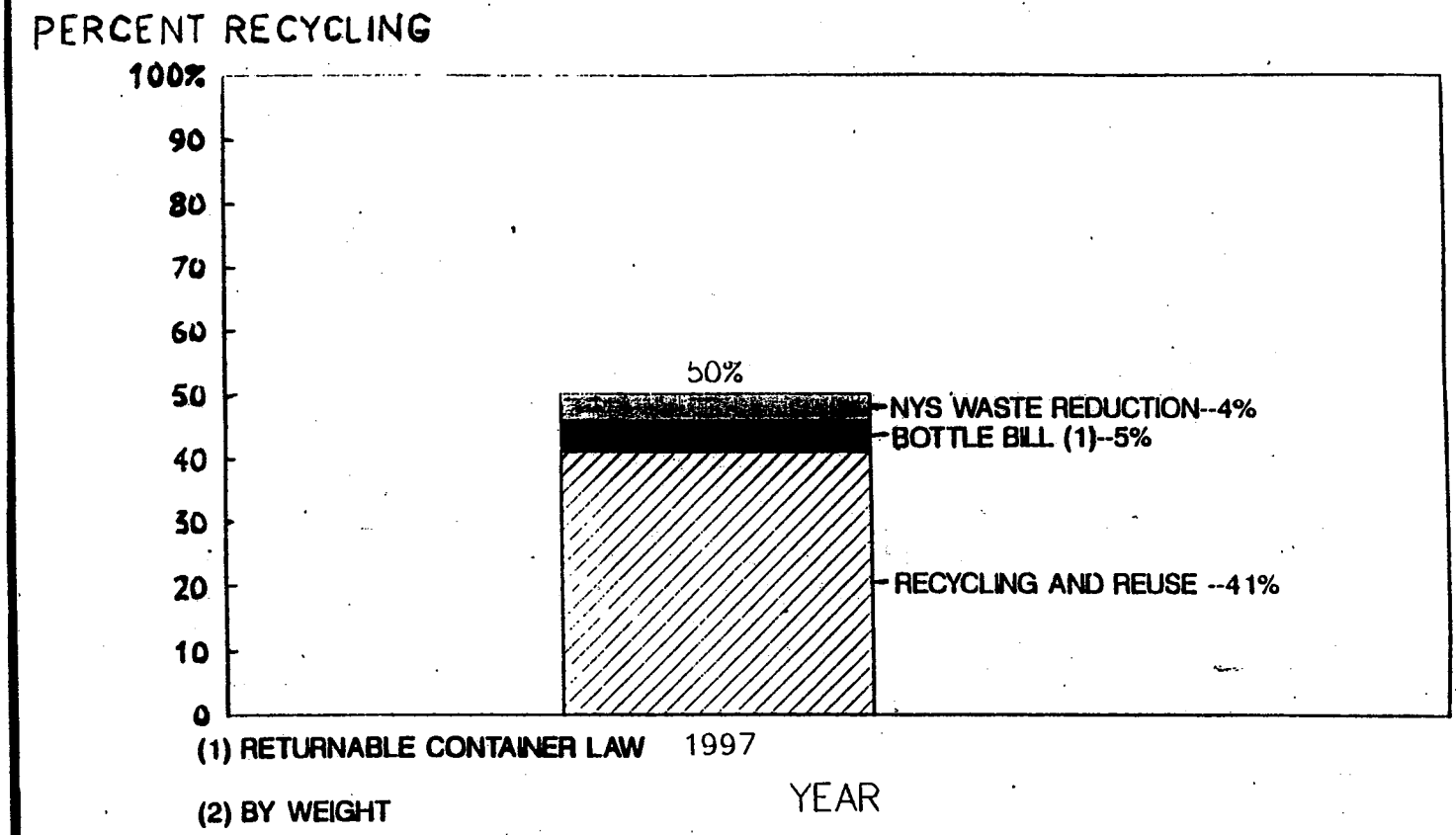


FIGURE 3-7

WASTE STREAM PROJECTIONS (TONS PER YEAR)

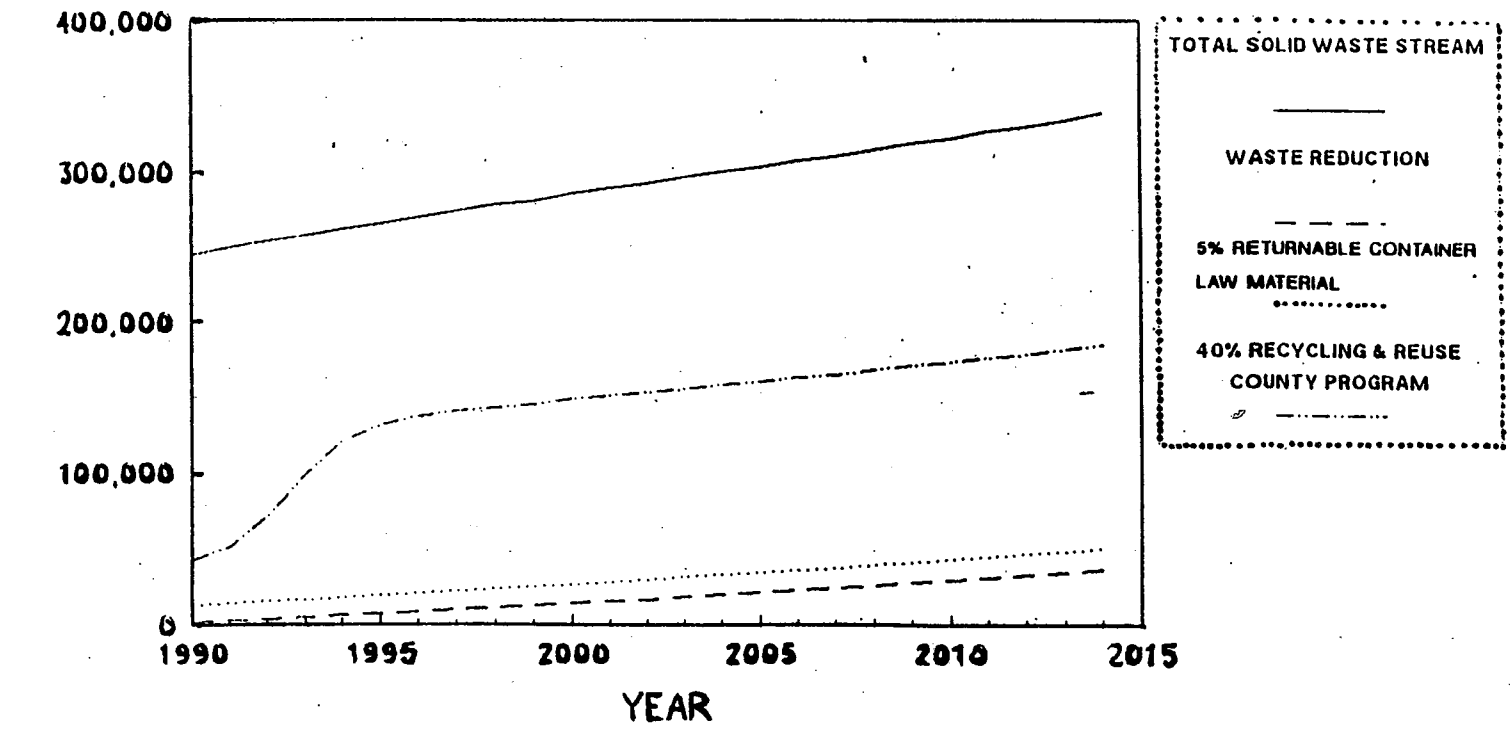


FIGURE 3-8
WASTE STREAM PROJECTIONS
(TONS PER DAY)

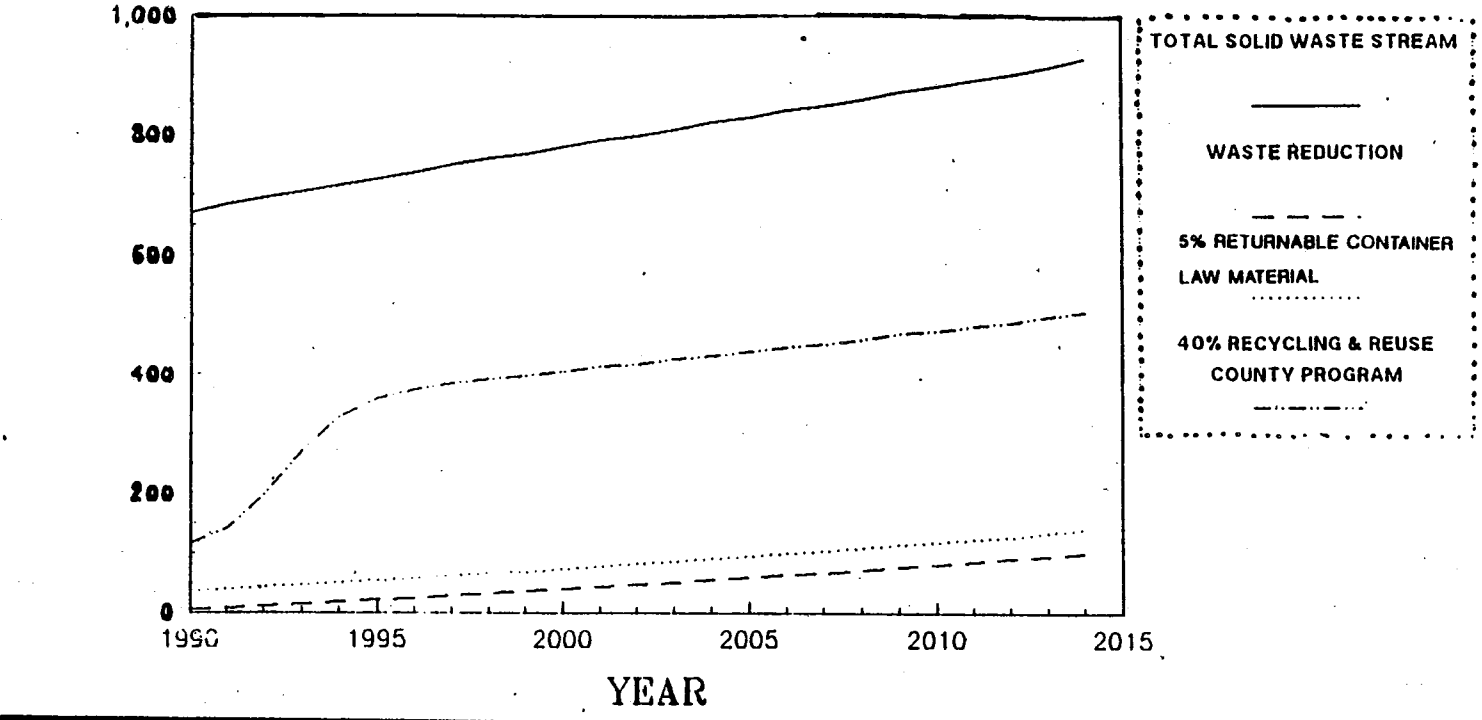
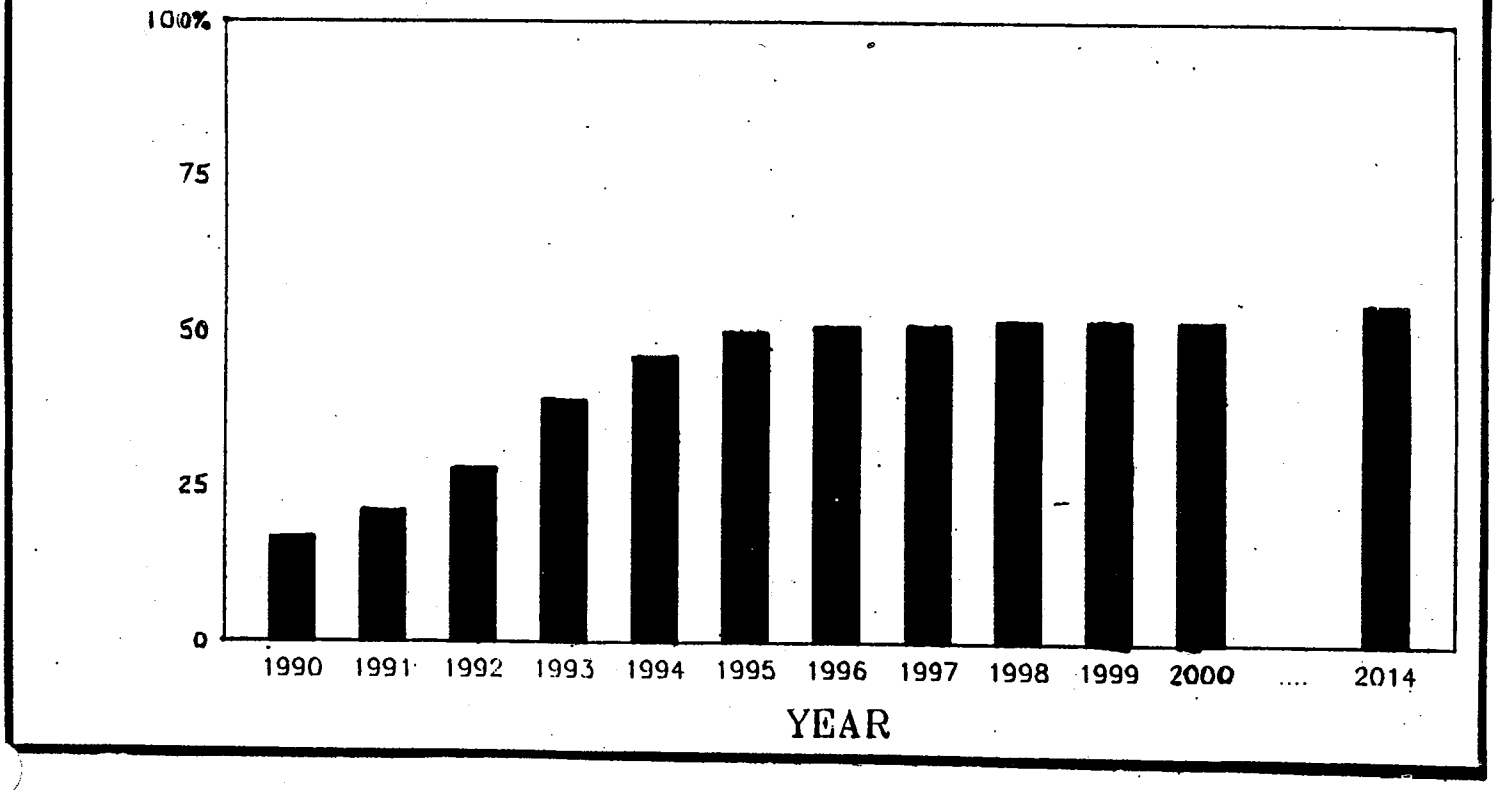


FIGURE 3-9
PROJECTED RECYCLING AS PERCENT OF THE WASTE STREAM



3.7 THE RESULTANT WASTE STREAM

The "resultant waste" stream is that quantity of solid waste requiring disposal after waste reduction, recycling and reuse have been applied to the total solid waste stream. Based on an application of 10% reuse and 40% recycling to the projected County solid waste stream, the resultant waste stream quantities have been estimated for each year of the planning period. Table 3-12 presents projected quantities at the 10%reuse and 40% recycling level for:

- **Total solid waste generated - annually**
- **The sum of solid waste reduction, reuse, and recycling - annually**
- **The resultant solid waste stream - annually**

TABLE 3 - 12
SUMMARY OF SOLID WASTE QUANTITIES
BASED ON
PROPOSED RECYCLING PROGRAMS

Year	Total Solid Waste Quantity (tons per year)	Waste Reduction, Recycling and Reuse Quantities (tons per year)	Resultant Waste Stream Quantities (tons per year)	Resultant Waste Stream Quantities Excluding Sludge (tons per year)
1990	245200	44000	202000	187000
1991	250000	54000	197000	181000
1992	254000	76000	179000	163000
1993	258000	106000	153000	137000
1994	262000	131000	139000	123000
1995	266000	145000	138000	121000
1996	270000	151000	136000	119000
1997	274000	155000	137000	119000
1998	279000	158000	138000	121000
1999	281000	160000	139000	121000
2000	286000	163000	141000	123000
2001	290000	166000	142000	124000
2002	292000	168000	143000	124000
2003	297000	171000	145000	126000
2004	301000	174000	146000	127000
2005	303000	176000	147000	128000
2006	308000	179000	148000	129000
2007	311000	181000	149000	130000
2008	315000	184000	150000	131000
2009	319000	187000	151000	132000
2010	322000	189000	152000	133000
2011	327000	192000	154000	135000
2012	330000	195000	154000	135000
2013	334000	198000	156000	137000
2014	339000	201000	157000	138000

As presented in Table 3-12, the total amount of solid waste expected to be generated in the year 2004 is 301,000 tons (approximately 825 tons per day). Of this reuse and recycling, at least 50% by weight will be diverted. The resultant waste (excluding sludge) would be 127,000 tons (approximately 348 tons per day) which would require disposal in a landfill.

When conducting the technology evaluation presented in Chapter 5.0 of the DGEIS and in Section 5.0 of this document, it was necessary to estimate the capacity or size of facilities for the planning. For purposes of sizing the recycling facilities, it was assumed that 10% percent reduction and 40% percent recycling would occur by 1997. When sizing the landfill and waste-to-energy facilities, it was assumed that 30 percent of the waste stream would be recycled by 1997. This approach provides for a level of redundancy within the overall solid waste management plan. Since landfill development is phased, the County will have the flexibility of using less landfill capacity or extending the life of the landfill, should the recycling programs exceed 30 percent recovery levels. Table 3-13 presents projected quantities at the 30 percent recycling level for:

- Total solid waste generated - annually
- The sum of solid waste reduction, reuse, and recycling - annually (assuming 30 percent recycling for facility sizing of landfill and waste-to-energy)
- The resultant solid waste stream - annually (assuming 30 percent recycling for facility sizing of landfill and waste-to-energy)

TABLE 3-13

SUMMARY OF SOLID WASTE QUANTITIES[1]
USED IN
TECHNOLOGY/ECONOMIC EVALUATION
(10% WASTE REDUCTION/30% RECYCLING)

Year	Total Solid Waste Quantity (tons per year)	Waste Reduction, Recycling and Reuse Quantities (tons per year)	Resultant Waste Stream Quantities (tons per year)	Resultant Waste Stream Quantities Excluding Sludge (tons per year)
1990	245000	44000	202000	187000
1991	250000	51000	200000	184000
1992	254000	71000	183000	168000
1993	258000	75000	183000	167000
1994	262000	89000	181000	165000
1995	266000	101000	182000	166000
1996	270000	103000	186000	167000
1997	274000	106000	184000	168000
1998	279000	109000	186000	170000
1999	281000	111000	188000	171000
2000	286000	113000	189000	173000
2001	290000	115000	191000	175000
2002	292000	117000	193000	175000
2003	297000	119000	194000	177000
2004	301000	121000	196000	179000
2005	303000	123000	198000	180000
2006	308000	126000	199000	182000
2007	311000	128000	201000	183000
2008	315000	130000	202000	185000
2009	319000	132000	204000	187000
2010	322000	135000	206000	188000
2011	327000	137000	209000	190000
2012	330000	139000	210000	191000
2013	334000	142000	212000	193000
2014	339000	144000	214000	195000

Note: (1) Quantities are rounded to the nearest thousand. Annual quantities may not add due to rounding.

3.6.3 SEPARATION EFFICIENCIES (SE) AND PARTICIPATION RATES (PR)

Separation Efficiencies (SE) and Participation Rates (PR) for 1990, 1992, 1994, and 1997 are described in detail in Chapter 3.0, Section 3.5 of the Recycling Action Plan (RAP).

The RAP uses the term "capture rates" to refer to the amount of recyclable material which are physically separated and recycled compared to the total amounts of these materials generated. "Capture Rates" include both separated and processing efficiencies. Also included in "Capture Rates" is the availability of collection systems. For example, residents who are used to putting leaves and yard waste out for curbside collection already demonstrate high separation efficiencies and could readily participate in yard waste recovery programs. Haulers, however, who have been putting yard waste into garbage compactors will need to develop yard waste collection systems, adjust routes, and possibly acquire and/or distribute special equipment before curbside collection of yard waste for municipal composting can be fully put into effect. (Backyard composting will be encouraged. In cases where this is not a desirable option, a transition in collection must occur.)

All sectors (commercial, institutional, and municipal) as well as residential households will be evaluated to determine "Capture Rates" or Separation Efficiencies (SEs). Participation Rates (PRs), the number of households or businesses participating in existing programs, will also include the percent of all sectors in the planning unit. (The number of municipal collection programs available for each material will effect participation rates.)

The RAP refers to certain factors which can lower "Capture Rates", such as losses through contamination, inefficient sorting, breakage, and misconceptions about what can or cannot be recycled. Education is key to addressing most of these behavioral deficits. Reuse is not listed as a cause for lowering separation efficiencies, but is considered waste reduction.

Waste reduction includes materials which are presently part of the waste stream except the following:

- Will no longer be generated due to waste reduction techniques (duplex copying, electronic mail, etc.);
- Will be diverted through waste exchanges or used on site (i.e., backyard composting or institutional composting);
- Are reusable, repairable, or refillable, but will eventually become part of the waste stream.

"Mixed paper" refers to high grade office paper, including white and colored ledger and computer print

-out. "Other paper" includes brown paper bags (kraft paper), magazines, junk mail, chipboard, disposable paper plates and cups, carbon paper, and coated or waxed paper. Most of these can be captured for recycling depending on whether an economic market exists. Much of what is not recycled will be increasingly diverted for composting as the technology is refined.

Other "miscellaneous recyclable materials" (non-IMA materials) as listed in Chapter 4 of this document, are included with their respective waste stream components in projected recycling rates. For example, Low Density Polyethylene (LDPE) is included as the main resin of film bags and Polystyrene (PS) is included with "other plastics". Waste oil, tires, textiles, and leather are listed accordingly. Batteries (auto and household), freon, and paint are included under Household Hazardous Waste.

Table 3-14 compares the 1990 projected SE and PR rates with the actual 1990 recycling volumes (in tons).

TABLE 3 - 14

1990 DATA	RAP PROJECTIONS 1990				ACTUAL 1990 TONS
	SE	PR	%WS*	TONS	
Newspaper	85%	39%	1.1%	2,600	2,741
Aluminum Cans	65%	15%	<.1%	40	4.3
Tin Cans	65	15	0.2	500	530
Glass Containers	75	30	1.2	3,000	1,583
Leaves	65	30	0.4	1,000	2,295
Grass	0	0	0.0	0	N/A
Brush	0	0	0.0	0	N/A
Corrugated Paper	80	15	0.5	1,200	1,311
Plastic Containers	50	15	<0.1	50	173
C & D	0	0	0.0	0	N/A
Tires	0	0	0.0	0	560
Waste Oil	50	80	0.4	1,000	46
Office Paper	75	10	0.1	200	1,018
White Goods	50	50	0.2	600	4,413
Mixed & other Paper	0	0	0.0	0	36
Plastic Film	0	0	0.0	0	0.00
Other Plastics	0	0	0.0	0	0.00
Textile & Leather	0	0	0.0	0	0.00
Apple, Grape Pommace and Offal	100%			13,100	N/A
Sludge	0	0	0.0	0	18.76

*WS = Waste Stream

ANALYSIS OF TABLE 3-14

- In a bottle bill state only a very small percentage (1.5%) of aluminum cans are recycled through municipal recycling programs. Most aluminum cans are diverted through redemption centers and, therefore, are excluded from this evaluation.

- Likewise, in a bottle bill state a large number of glass bottles are diverted for deposit. Unfortunately, because of a loophole in the Returnable Container Law, some of this lower revenue material ends up in landfills, and is not recycled through municipal programs. However, the actual vs. projected amount is still quite low for glass.

- Leaf and Yard Waste Composting program is ahead of predicted schedule with Tub Grinder actively operating in most Ulster County municipalities.

- Plastic containers, mainly HDPE, are also ahead of predicted schedule, even with a large percentage of PET diverted under the Returnable Container Law. A higher separation efficiency (perhaps 60-70%) was accompanied by greater participation than expected (20%). This will increase even more in 1991-1992 as more municipal programs recycle plastic containers and markets for more resins are secured.

- Some C&D was recycled in 1990 by a private commercial hauler with a C&D recycling facility, but volume information was not available. C&D will be included in future tracking systems and C&D recycling will be promoted over disposal by landfilling whenever possible.

- Waste oil includes only those amounts accounted for by local recycling centers, Ulster County DPW, and a few service stations that were included in the 1990 tracking system. Better tracking and more public education will improve this figure.

- Office paper volumes were much higher than predicted. This was due to a few excellent, early efforts in the commercial/institutional sector. These pioneering examples will be used to promote other programs in the commercial/institutional sector.

- Scrap metal, including white goods and appliances, far exceeds predictions. The market changed from -$20/ton to no cost/no revenue to +$10 to +$15/ton for scrap metal in 1990. Several municipalities stockpiled scrap metal, which is easy to set aside, and sold the material as market conditions

improved. Another motivating factor was that municipalities needed to clear space for their Municipal Recycling Drop-Off Sites (MRDS).

- Other paper recycled in 1990 included magazines, "junk mail", and brown paper bags from a few enthusiastic and comprehensive municipal recycling programs.

- Plastic film is being recycled in some retail stores and dry cleaners; it has not yet been included in the tracking system.

- The UCRRA tracking system will include apple and grape ~~pomace~~ and offal in 1991.

Other factors which have influenced the PR's and SE's for 1990 include:

- Availability of storage equipment (household and commercial containers), collection systems, and recycling programs as described in Section 2.3.6 of this document;

- Availability of markets and difficulty in meeting market specifications as described in Section 4.0 of this document;

- Public education for all sectors as described in Section 9.3.1 of this document and in the Recycling Education Work Plan found in Section 12.3;

- Convenience and reliability of curbside collection; access to Municipal Recycling Drop-Off Sites for self-haulers;

- Effective sorting and/or upgrading in processing centers as described in Section 9.3.3 of this document;

- Mandatory legislation with effective enforcement as described in Section 9.3.5 of this document;

- Creation of local waste exchanges to increase the number and types of materials that can be diverted.

In order to be able to assess and report more accurately PR's and SE's and to project more precisely PR's and SE's for 1994, 1997, and 2014, UCRRA has initiated several programs to:

- Establish a comprehensive tracking system for all solid waste management programs including waste reduction, recycling, and composting efforts. (See Section 9.3.4, page 9-30 of this document.)

- o Prepare and distribute a recycling participation survey to over 50,000 residents in Ulster County. (See Reference Section 12.5 of this document for a copy of the survey.) This survey will be distributed between June - December 1991 and evaluated in the winter of 1992. A similar survey will be extended to the commercial sector in the fall of 1991.

- o Continually review and update the waste stream analysis as described in Section 3.0 of this document.

- o Review commercial/industrial/institutional waste audits as described in Section 9.3.4, page 9-31.

- o Continue to assess the number of public and private programs involved in collecting/ marketing recyclables. This will be done through reviewing and analyzing commercial sector waste audits and recycling plans that must be submitted under the County's Mandatory Source Separation and Recycling Law.

FUTURE PROJECTIONS (SE & PR)

Tables 3-15a, 3-15b, and 3-15c project SE's and PR's for the years 1994, 1997, and 2014 respectively.

- **1994** (Table 3-15a) - End of the Interim Planning Period;

- **1997** (Table 3-15b) - The year New York State has set to achieve its Recycling Goals;

- **2014** (Table 3-15c) - Last year in Planning Period.

These are "best case scenarios" and utilize "maximum recycling" data on PR's and SE's developed in conjunction with Dave Vitale of the NYS DEC, Bureau of Waste Reduction and Recycling. The information comes from nationally recognized programs, such as the Seattle, Washington efforts, which have been highly successful. The percent of waste stream numbers used in the tables are based on an analysis of information contained in Tables 3-8 and 3-11 of this section.

The category "miscellaneous" refers to dirt and fines, mixed materials made of various inseparable components and materials not listed in other categories. It is very possible that a percentage of these materials may eventually be diverted by some form of municipal solid waste processing. No projections have been made for diverting any of these materials, as "The Plan" calls for monitoring and evaluating MSW processing as an innovative technology, but not for implementation at this time.

The projected amounts of materials recycled or diverted by various management systems for 1994, 1997, 2014 are listed in the Waste Flow diagrams in Chapter 9 of this document, Figures 9-1b, 9-1c, and 9-1d. The maximum recycling rates (SE X PR) which can be predicted for these years are listed in Table 3-15a, 3-15b, and 3-15c. The figures from the waste flow diagrams will be used for facility sizing (taking into consideration how much and which materials will be processed in each facility), with flexibility built into accommodate maximum waste reduction and recycling rates. It is the Agency's goal to achieve the highest rates possible and every effort will be made to so.

1994 (Table 3-15a)

In 1994, recycling rates for residential/commercial materials recycling are projected to be in the range of 20% (Figure 9-1b) to 27% (Table 3-15a) Add to that 1.2% for tires and waste oil and approximately 2% for C&D debris recycling. Since facilities are still being constructed or are in early phases of operation in 1994, the program will not yet handle as many materials as it will be able to accommodate in 1997. A lot depends on the availability of markets for less commonly recycled materials. Municipal Organic Waste Composting (MOWC) will be handling the co-composting of yard waste, including clean wood chips as a bulking agent, and sewage sludge. Diversion of apple & grape pomace to farmers for use as an animal feed supplement will continue. What cannot be used as feed will be composted at the MOWC facility. Offal is presently being diverted to "renderers", and this practice will continue.

Sludge composting will be getting underway in 1994. The "Sludge Management Alternatives Study" by the NYS Environmental Facilities Corporation for the Hudson Valley Regional Council, published in January, 1990, indicates that 43% (by weight in dry tons per year) of the sludge generated by sewage treatment plants in Ulster County have acceptable levels of heavy metals. The acceptable sludges come from 3 of the 15 facilities that were tested. Twelve facilities had metal counts that exceed regulations, although some may be in the acceptable range by 1994. Forty percent participation is predicted for 1994. In order for facilities to lower their heavy metals to an acceptable range, the source(s) of contamination must be determined and remediated. Even the facilities where sludge initially tested safe will have an occasional load that will be above acceptable levels, hence an 80% separation efficiency is predicted.

Table 3 - 15 a
1994 SEPARATION EFFICIENCIES AND PARTICIPATION RATES

	% Waste Stream Generated	Res. & Comm. TPD	Separation Efficiencies (SEs)	Participation Rates (PRs)	Recycling Rates (SE x PR)	Recycling Volumes (TPD)	% Waste Stream Recycled
Waste Stream Components							
Newspaper	4.3%	31	85%	82%	70%	22	3.0%
Corrugated Cardboard	4.3%	31	85%	82%	70%	21	3.0%
Mixed (Office) Paper	2.2%	16	80%	82%	66%	10	1.4%
Other Paper	18.8%	135	60%	82%	49%	66	9.3%
Plastic Containers	0.4%	3	75%	82%	62%	2	0.2%
Plastic Film	2.8%	20	60%	82%	49%	10	1.4%
Other Plastic	3.4%	25	60%	82%	49%	12	1.7%
Aluminum Cans	0.2%	1	75%	82%	62%	1	0.1%
Tin (Ferrous) Cans	1.9%	14	70%	82%	57%	8	1.1%
Scrap Metal & White Goods	1.4%	10	* 90 - 95%	85%	77%	8	1.1%
Container Glass	5.5%	40	75%	82%	62%	24	3.4%
Other Glass	< 0.1%	0.4	60%	82%	49%	0.2	0.1%
Textiles & Leather	1.7%	12	75%	82%	62%	7	1.0%
Subtotal - Res. & Comm.	46.9%	337				92	26.7%
Construction & Demolition	8.4%	60	* 50 - 75%	* 50 - 75%	25%	15	2.1%
Apple & Grape Pomace/Offal	5.0%	36	95%	95%	90%	32	4.5%
Other Food Waste	4.2%	30	--	--	0%	0	0.0%
Leaf and Yard Waste	10.3%	74	* 90 - 95%	* 80 - 85%	72%	53	7.4%
Sludge	6.0%	43	80%	40%	32%	14	1.9%
Subtotal - MOWC; sludge	25.5%	183				100	13.9%
Tires	0.8%	5	85%	82%	70%	4	0.5%
Waste Oil	1.0%	7	80%	82%	66%	5	0.7%
Subtotal - tires; waste oil	1.8%	13				9	1.2%
Total	82.5%	592				315	43.9%
Non-hazardous Industrial	8.2%	59	**	**		0	0.0%
Miscellaneous *	6.3%	45				0	0.0%
Subtotal-Non-haz.ind.; misc.	97.0%	696				315	43.9%
Waste Reduction **		22				22	3.1%
TOTAL	97.0%	718				337	46.9%

* See text for explanation of ranges and "Miscellaneous"

** Waste reduction includes "backyard composting" of food and waste exchanges of non-hazardous industrial materials.

Note: Projected SEs & PRs, and recycling rates calculated from SEs & PRs, are theoretical, based on maximum recycling.

Table 3 - 15 b
1997 SEPARATION EFFICIENCIES AND PARTICIPATION RATES

	% Waste Stream Generated	Res. & Comm. TPD	Separation Efficiencies (SEs)	Participation Rates (PRs)	Recycling Rates (SE x PR)	Recycling Volumes (TPD)	% Waste Stream Recycled
Waste Stream Components							
Newspaper	4.3%	32	85%	90%	77%	25	3.3%
Corrugated Cardboard	4.3%	32	85%	90%	77%	25	3.3%
Mixed (Office) Paper	2.2%	16	80%	85%	68%	11	1.5%
Other Paper	18.8%	141	* 70 - 80%	85%	60%	84	11.2%
Plastic Containers	0.4%	3	85%	90%	77%	2	0.2%
Plastic Film	2.8%	21	60%	85%	51%	11	1.4%
Other Plastic	3.4%	26	60%	85%	51%	13	1.7%
Aluminum Cans	0.2%	1	85%	90%	77%	1	0.1%
Tin Cans	1.9%	14	70%	90%	63%	9	1.2%
Scrap Metal & White Goods	1.4%	11	* 90 - 95%	95%	77%	7	1.0%
Container Glass	5.5%	42	85%	90%	77%	32	4.2%
Other Glass	< 0.1%	0.4	60%	85%	51%	0.2	0.1%
Textiles & Leather	1.7%	12	75%	85%	64%	7	0.9%
Subtotal- Res. & Comm.	46.9%	352				227	30.2%
Construction & Demolition	8.1%	61	* 65 - 80%	* 65 - 95%	42%	26	3.4%
Apple & Grape Pomace/Offal	4.8%	36	95%	95%	90%	32	4.3%
Other Food Waste	4.3%	32	75%	50%	38%	12	1.6%
Leaf and Yard Waste	9.6%	71	* 90 - 95%	90 - 95%	81%	58	7.7%
Sludge	6.1%	46	90%	75%	68%	31	4.1%
Subtotal - MOWC; sludge	24.8%	185				133	17.7%
Tires	0.8%	6	85%	95%	81%	4	0.5%
Waste Oil	1.1%	8	80%	85%	68%	5	0.6%
Subtotal - tires; waste oil	1.9%	14				9	1.1%
Total	81.7%	613				394	52.5%
Non-hazardous Industrial	7.9%	59	**	**		0	0.0%
Miscellaneous *	2.8%	21				0	0.0%
Subtotal-Non-haz.ind.; misc.	92.3%	693				394	52.5%
Waste Reduction **	7.7%	58				58	7.7%
TOTAL	100.1%	751				452	60.2%

* See text for explanation of ranges and "Miscellaneous"

** Waste reduction includes "backyard composting" of food and waste exchanges of non-hazardous industrial materials.

NOTE: Projected SEs & PRs, and recycling rates calculated from SE & PRs, are theoretical, based on mazimum recycling.

Table 3 - 15 c
2014 SEPARATION EFFICIENCIES AND PARTICIPATION RATES

	% Waste Stream Generated	Res. & Comm. TPD	Separation Efficiencies (SEs)	Participation Rates (PRs)	Recycling Rates (SE x PR)	Recycling Volumes (TPD)	% Waste Stream Recycled
Waste Stream Components							
Newspaper	4.3%	40	90%	95%	86%	34	3.7%
Corrugated Cardboard	4.3%	40	90%	95%	86%	34	3.7%
Mixed (Office) Paper	2.2%	20	90%	95%	86%	17	1.9%
Other Paper	18.8%	175	* 85 - 90%	95%	81%	141	15.2%
Plastic Containers	0.4%	3	85%	95%	81%	3	0.3%
Plastic Film	2.8%	26	75%	95%	71%	19	2.0%
Other Plastic	3.4%	32	75%	95%	71%	23	2.4%
Aluminum Cans	0.2%	2	85%	95%	81%	1	0.2%
Tin Cans	1.9%	18	70%	95%	66%	12	1.3%
Scrap Metal & White Goods	1.4%	13	95%	95%	90%	12	1.3%
Container Glass	5.5%	51	85%	95%	81%	41	4.5%
Other Glass	< 0.1%	0.7	60%	95%	57%	0.4	0.1%
Textiles & Leather	1.7%	15	75%	95%	71%	11	1.2%
Subtotal - Res. & Comm.	46.8%	436				349	37.5%
Construction & Demolition	8.6%	80	* 70 - 90%	* 90 - 95%	63%	50	5.4%
Apple & Grape Pomace/Offal	3.9%	36	95%	95%	90%	32	3.5%
Other Food Waste	5.2%	48	90%	75%	68%	33	3.5%
Leaf and Yard Waste	8.5%	79	95%	95%	90%	71	7.7%
Sludge	6.0%	56	90%	90%	81%	45	4.9%
Subtotal - MOWC; sludge	23.6%	219				182	19.6%
Tires	0.6%	6	95%	95%	90%	5	0.6%
Waste Oil	1.0%	9	95%	95%	90%	8	0.9%
Subtotal - tires; waste oil	1.6%	15				13	1.5%
Total	80.6%	751				594	63.9%
Non-hazardous Industrial	7.6%	71	**	**		0	0.0%
Miscellaneous *	0.6%	6				0	0.0%
Subtotal-Non-haz.ind.; misc.	88.9%	828				594	63.9%
Waste Reduction **	11.0%	102				102	11.0%
TOTAL	99.9%	930				696	74.9%

* See text for explanation of ranges and "Miscellaneous"

** Waste Reduction includes "backyard composting" of food and waste exchanges of non-hazardous industrial materials.

NOTE: Projected SEs & PRs, and recycling rates calculated from SEs & PRs, are theoretical, based on maximum recycling.

1997 (Table 3-15b)

In 1997, Recycling Rates are projected to range from 29% (Figure 9-1c) to 35% (Table 3-15b). This includes tires and C&D debris recycling. Municipal Organic Waste Composting and other diversion will handle up to 15% food and yard waste, plus 4% sludge composting. Sewage sludge is expected to achieve 90% separation efficiency with 75% participation by facilities. MOWC will include food waste from restaurants and institutional food preparation, and may include a pilot residential food program. Composting of some cardboard, food-contaminated paper products, and other low grade paper (approximately 7 tpd or 1% which is included in the "other paper" recycling rate). Composting can serve as a backup management method for paper when and if market conditions for recyclable paper becomes unfavorable.

2014 (Table 3-15c)

By 2014, it is predicted that from 73% (Figure 9-1d) to 75% (Table 3-15c) of the waste stream will be reduced, recycled, composted, or otherwise diverted. It should be noted that the range narrows over time as solid waste management facilities become fully operational, and as behavioral changes are integrated into the lifestyles of all sectors of the community and the Mandatory Source Separation Law is expanded and enforced. By 2014 food and yard waste composting/diversion will account for nearly 20% of the total solid waste stream. MOWC in 2014 will include 49 tpd or 5.3% paper, which is listed under "other paper", in recycling rates generated using SE's and PR's.

General

In Tables 3-15a through c, certain materials were listed by ranges, rather than by specific PR's and SE's. For materials such as "other paper", scrap metal, and white goods, construction and demolition debris, lead and yard waste, there is a higher degree of uncertainty as to marketability, collection systems and other factors which influence participation rates and separation efficiencies. In each of these cases, the lower number was used conservatively to predict the recycling rate. Uncertainty regarding other paper and yard waste has already been discussed.

For construction and demolition debris, systems for sorting materials into recyclable categories need to be perfected. The one privately-owned C&D recycling facility in the County is presently removing cardboard and scrap metals. Most C&D debris wood is painted or treated and cannot be composted. Wood, plaster, brick,

concrete, and other kinds of rubble are currently being ground for volume reduction, then landfilled. This may account for some waste reduction, but does not constitute recycling. While ground up components of C&D debris have potential beneficial uses either in compost or as clean fill, there are serious concerns that need to be addressed regarding the potential for "cocktailing" these materials with toxic or hazardous materials.

With regard to scrap metal, a material that is already being extensively separated for recycling throughout the County, there are some components that are not acceptable. For example, several markets will not take box springs, hangers, or other types of scrap metal. In some areas of County, it is still common practice to dump scrap metal illegally in out-of-the-way sites. Offenders are difficult to catch. These are some of the problems which must be overcome to achieve the higher number in the range.

4.0 ANALYSIS OF RECYCLING MARKETS

4.0 ANALYSIS OF RECYCLING MARKETS AND MATERIALS

4.0 INTRODUCTION

In March, 1988, UCRRA consultants surveyed markets both within the region (Ulster County and all counties sharing a contiguous border) and outside the region. This survey, with an analysis of the potential marketability of recyclable materials, is found in the DGEIS, Volume IV, Recycling Action Plan (RAP), Chapter 4.0. This section updates the survey conducted in 1988 and presents an analysis of recycling markets and materials as of April 1991.

Section 4.1, UCRRA Market Survey for Major Materials Recycling, reviews available information on potential recycling markets and describes the process of market survey and negotiations used by the UCRRA to establish market contracts for materials included in Intermunicipal Agreements (IMAs). These agreements were signed in August 1990, by nineteen towns and the City of Kingston and constitute the development of the third phase of the Agency's Satellite Aggregation Center (SAC) system.

A Market List, listing all local, regional, and other markets that have been or will be contacted by the Agency in its search for markets for Ulster County's recyclable materials is found in the reference section, Section 12.4 of this document. This list is updated on an ongoing basis.

Section 4.2 contains an updated analysis, with current information on the marketability of potentially recyclable materials the availability of secondary materials markets, as of February 1991. This section includes information on market services available for each material and for multi-material. It includes the types of processing necessary for separation , upgrading, densification, or other beneficiation of materials to maximize both the amounts of materials diverted from the waste stream and revenue generated from each. A complete summary of the Recycling market survey can be found in Section 4.2.24, Tables 4-3a and 4-3b. Transportation arrangements, by material, are also discussed. Processing and transportation are then summarized in Section 4.3.

Section 4.3 summarizes the transportation and processing responsibilities that are necessary to move recyclables to the market.

Section 4.4 discusses potential local and regional initiatives for market development, identifies any current and future restrictions to market development, and discusses the potential benefits of future regionalization efforts.

4.1 UCRRA MARKET SURVEY FOR MAJOR MATERIALS RECYCLING

UCRRA consultants developed a market survey for the DGEIS/RAP in March, 1988. This information is kept updated on an ongoing basis by surveying the various Municipal Recycling Coordinators (MRCs) for any markets or proposed markets associated with local efforts. The staff of the Agency regularly attends recycling meetings and conferences, subscribes to trade journals and publications, including the American Recycling Market Directory, and keeps in contact with the NY State Department of Environmental Conservation, Office of Waste Reduction and Recycling, and the NY State Department of Economic Development, Office of Recycling Market Development. The Agency's list of recycling markets has been developed from information from these and other sources.

In December, 1989, the search for markets for the six major materials listed in the IMA (newspaper, glass, metal cans, plastic, cardboard, and office paper) began with a request for expressions of interest sent to 72 potential markets. This first request resulted in 16 responses.

Ongoing marketing team meetings between the UCRRA staff, the Agency Board members, and the UCRRA recycling consultants, Resource Integrated Systems (RIS), continued on a regular basis during 1990.

On July 5, 1990, a second request for market expressions of interest was sent out. This request included more information on the SAC system, 1989 volume data, and projected volumes for 1990-93. It was sent to 123 markets:

6	aluminum cans and scrap metal
17	glass
26	multi-materials
30	paper (ONP, OCC, and high-grades)
28	plastic
16	steel can
123	Total markets' Expressions of Interest

A preliminary market analysis completed on August 8, 1990, and a market summary prepared on September 5, 1990, showed that 75 markets (including several multi-material markets) were interested in purchasing various materials. These were broken down as follows:

11	aluminum cans and scrap metal
6	glass
31	paper:
	9 news
	11 OCC
	11 high-grade
17	plastic
10	steel cans
3	other materials
75	Total markets

In September the UCRRA made a policy decision to use end-markets, wherever possible, in order to maximize revenue. They also elected to interview multi-material markets, before making a final decision, on how to best market Ulster County's materials both in the interim (before processing capability at SACs) and in the long-term.

Interviews with potential markets began in October, 1990, and continued through January, 1991. (See Schedule for Market Negotiations, Table 4-1) On January 8, 1991, the Agency Board authorized contractual agreements for the following materials:

Newspaper - With Garden State Paper, a 5-year contract for grade #8 news (newspaper, tied or bundled; no bags, no junk mail, etc.) Grade #8 newspaper will be hauled by Ulster County Roll-Offs, Inc.

Under Separate contract with the Agency, Ulster County Roll-offs, Inc. will haul newspaper stored in the Agency's 40-cubic yard roll-offs from the Municipal Drop-Off Sites (MRDS), aggregate 11 tons into 22-ton loads, and haul to Garden State/Garfield, NJ mill. The Agency is committed to supply Garden State with 150 to 250 tons per months (1800 to 3000 tons per year). Revenue: +$25/ton delivered to Garfield. Net projected revenue: approximately +$7,000 for 1991, as compared with a cost of about -$60,000 for 1990. Two other offers (Laidlaw, which includes magazines, and Paper Trade USA, which includes lower grades of news) are being researched further as back-up markets.

TABLE 4 - 1
IMA MARKET NEGOTIATIONS & FACILITY SITE VISITS

1990:	
Mar. 22	Site visit to RRT Empire Returns, Syracuse, NY (Multi-material and green glass from Owens)
Oct. 26	Site visit to Owens-Illinois, Fulton, NY (flint and amber glass plant)
Oct. 31	Laidlaw (news); Garden State Paper (news)
Nov. 13	Pace Glass (color-separated glass and window pane) AMG (steel cans) RRT (multi-materials) o News; #6 or #8 baled, OCC; baled #11, glass, tin cans (baled, flattened or densified), aluminium cans (baled or flattened), plastic (baled PET, mixed or natural HDPE) o MRF in Syracuse, NY
Nov. 14	Alcoa Aluminium (aluminium cans)
Nov. 28	Fox Run (multi-materials); o News, OCC, Tin, Plastic o MRF in North Branch, NJ Reynolds Aluminium (aluminium cans & scrap) Owens Glass (color separated container glass)
Dec. 4	Proler/Formato (steel cans) Revised RRT Empire Returns proposal received
Dec. 6	Plastic Recovery Corp.
Dec. 12	Hudson Baylor (multi-materials)
Dec. 17	Site Visit to Hudson Baylor
Dec. 21	J.C. Paper (news) conference call
1991:	
Jan. 2	Revised Ellenville Scrap proposal received
Jan. 4	Ellenville Scrap
Jan. 16	Site visit to National Recycling, Marlboro, NY
Feb. 1	Site visit to Ellenville Scrap, Ellenville, NY
Feb. 13	First load of plastic from Plattekill brought to Hudson Baler for trial processing and marketing.

UCRRA has negotiated a contract agreement with Marcal and is encouraging municipalities to pursue interim market agreements with Marcal or other paper markets for magazines, junk mail, etc.

Glass - With Pace Glass, a 3-year contract for color-separated container glass and separated window pane. NO ceramic, stones, drinking glasses, mirrors, light bulbs, crystal, pyrex, etc. The range of revenues depends on delivery options, +$10 to +$20/ton to +$35/ton if the Agency delivers to Jersey City. Net projected revenue: approximately +$12,000 in 1991.

Metal Cans - With Ellenville Scrap, a 2-year contract (1 year, with option to renew) at +$27/ton delivered to Ellenville or +$15/ton picked up at an interim SAC. This contract is for tin and aluminum cans only. Aluminum scrap (foil, siding, etc.) will still be marketed directly by municipalities, if collected, until the final SAC is operational. Net projected loss: approximately -$7,000 in 1991.

Plastics and Cardboard - On August 29, 1990 and again on February 6, 1991, the staff of the Agency met with Jay Hogan, Superintendent of Public Works for the City of Kingston, regarding processing of plastic and cardboard at the Kingston Transfer Station on an interim basis until the SACs are permitted, constructed, and operational. The Agency will continue to negotiate with markets for plastics (minimum PETE and HDPE, and other resins if feasible) and cardboard and expects to negotiate market agreements for these materials by June/July 1991.

Office Paper - A contract to market office and computer paper was signed in November, 1990 with National Recycling of Marlborough for the Ulster County Office Building Complex pilot paper recycling effort. This contract is for one year with an option to renew at the end of the first year. The first 1.9 tons of paper was sent to market on January 16, 1991, representing 2 months collection. The Agency re-evaluated markets for a Countywide collection of high-grade office and computer paper from the IMA municipalities by June, 1991. In May 1991, National Recycling of Marlborough closed its doors and went out of business. UCRRA immediately began to negotiate a new agreement by July 1991.

4.2 UPDATED ANALYSIS OF POTENTIAL MARKETS FOR RECYCLABLE MATERIALS

4.2.1 NEWSPAPER

Paper and paperboard constitute approximately 40.0% of the municipal solid waste (MSW) stream according to Franklin and Associates. This percentage has steadily increased from 34.1% in 1960. Recovery rates for these materials have also increased from 18.1% in 1960 to 25.6% in 1988. [EPA, Characterization of MSW in US: 1990 Update, page 11, (see Table 4, page 13 for specific breakdown of paper waste stream).]

Newspaper represents 18.5% of Ulster County's waste stream waste paper and paperboard or 8.5% of the total MSW stream. Thirty-three percent of this material is recovered nationally. [EPA, Characterization of MSW in US: 1990 Update, page 10-13.] **UCRRA Newspaper Recycling Development Project** (October, 1988 to December, 1990).

As discussed in the DGEIS, Volume IV (RAP), Sections 4.0 and 9.0, and in Section 2.0 of this document, "Existing Solid Waste Management Effort", the newspaper development project was the first effort to collect recyclable material on a coordinated Countywide basis. Transportation, processing, and marketing of newspaper was contracted to Ulster County Roll-Offs, Inc. A total of 3,130 tons of newspaper was collected in 30-cubic yard roll-off containers located at participating municipalities. This material earned the Agency +$5/ton in 1988 and early 1989. This decreased to a cost of -$35/ton in July, 1989 through December, 1990. In February, 1991, the Agency began receiving +$25/ton under its new long-term arrangement.

Local markets (including JC Paper of Poughkeepsie, Red Hook Paper, and Thruway Paper, a Garden State Paper subsidiary in Suffern, NJ) stopped paying positive revenues for newspaper in late 1989, early 1990. Soon after these markets began charging municipalities as much as -$15/ton for loose #8 news delivered to their facility, but several of them are now paying or at least not charging for loose news.

Formisano, a broker/processor in Newburgh (Orange County), continued to collect newspaper, cardboard, magazines, and office paper, separated into categories. Storage trailers and transportation were provided at no cost, but no revenue was paid for newspaper during this period. Formisano had serviced the Towns of Marbletown, Plattekill, and Woodstock for many years and continued to do so through 1990. Service became increasingly slow as

markets became "saturated". All three municipalities have now signed IMAs with the Agency for newspaper, corrugated cardboard, and office paper.

In retrospect, the announcement of statewide mandatory recycling for New Jersey in the summer of 1987 and the passage of the Solid Waste Management Act (with its four-year grace period for mandatory recycling in New York State) in April, 1988, signalled increasing availability of the supply of old newspaper. The markets responded by significantly decreasing revenues for this material.

In 1990, however, the market outlook improved dramatically for newspaper as a result of the NY State Department of Economic Development's (DED) initiative with 46 major New York newspaper publishers who signed an agreement to purchase increasing amounts of recycled fiber, up to 40%, by the year 2000. This stimulated the development of increased mill capacity for secondary newspaper (and magazines) by Laidlaw/Canadian Pacific, Kruger, Jefferson Smurfit, and others. In addition, according to the American Newspaper Publishers' Association (ANPA), there are 16 de-inking projects with capacity for 4.3 million tons per year of recycled newsprint in progress and 23 others under consideration [Recycling Times 2/2/91]. "Newspaper producers are committed to investments totaling $1.5 billion to more than double the output of recycled newsprint... by 1993." [John Holusha, "The Tough Business of Newspaper Recycling", New York Times, January 6, 1991, page F9].

Responses to the Agency's July 5, 1990 request for "Expressions of Interest", analyzed in September, 1990, ranged from -$35/ton for loose #6 news, -$30/ton for loose #8 regular news (delivered to market), to +$25/ton for baled #8, FOB Ulster County under a proposed minimum 10-year contract.

Negotiations in late 1990 and early 1991 resulted in the following revenue figures:

JC Paper:	-$15/ton, loose regular news, delivered to Poughkeepsie
Garden State:	+$15/ton, loose delivered to Thruway Paper; or +$25/ton, loose delivered to Garfield, New Jersey mill
Laidlaw:	+$25/ton FOB UCRRA's dock, Ulster County, news and magazines baled, long-term 10-year contract with deferred revenue and penalties

Various other brokers responded with intermediate figures.

Newspaper continues to be a highly desirable commodity because of the ease with which it can be source separated and collected for recycling and its improving marketability die to increasing potential mill capacity.

Newspaper is presently being stacked in 40-cubic yard roll-off containers at MRDS. This is somewhat labor-intensive and involves double handling for haulers. The construction of bi-level loading areas at MRDS will improve handling for both residents and haulers. Self-haulers could have the option of using paper bags to collect and store newspaper at home (presently it must be tied in bundles), then empty the newspaper into the roll-off and recycled the paper bag (possibly with cardboard). Once a processing center (SAC) is operating, curbside customers may be able to utilize this option as well, if bags can be removed manually along the conveyor line before baling. This should increase both participation and separation efficiencies. The ability of the SACs to create mill or export-sized bales will greatly increase future market options. (Presently , the nearest baling services are in Poughkeepsie and Newburgh.)

4.2.2 CORRUGATED CARDBOARD (OCC)

Corrugated cardboard represent 32.2% of the paper waste stream, 12.9% of the MSW stream and its national recovery rate is 45.5% [EPA, Characterization of MSW in US: 1990 Update, p. 10-13]

It represents a significant portion of the commercial/institutional/industrial waste generated. Both commercial and residential collections are possible, and are already occurring in many municipalities in Ulster County, both at curbside and by drop-off. This material is included in the six basic IMA recyclable materials and Countywide collection began in April, 1991.

Cardboard must be kept clean, dry, and free of food residue or other contamination. It will be flattened and tied in manageable bundles for ease of handling and volume reduction, unless it is put directly into a compactor truck or trailer.

For larger commercial and institutional generators, such as retail stores, shopping malls, schools, and hospitals compacting on-site and/or marketing directly may be cost-effective options. For smaller and intermediate

generators, a Countywide marketing effort will be more efficient.

Much of the cardboard presently collected in Ulster County is being delivered by haulers and municipalities to the Kingston Transfer Station where it is compacted into trailers and transported to JC Paper in Poughkeepsie. Baling capability will also greatly enhance the marketability of this material.

Revenues of +$15/ton to +$40/ton for unbaled cardboard, with a $10 to $20 premium for baled cardboard, were quoted in 1988. Supply has increased as businesses and municipalities prepare for mandatory recycling and prices in 1990 ranged from -$15/ton loose and delivered to Poughkeepsie, to as high as, +$25/ton to +$35/ton baled, FOB Ulster County. A large horizontal baler will clearly be necessary to maximize revenues for cardboard.

4.2.3 OFFICE AND COMPUTER PRINT-OUT (CPO) PAPER

Office and computer paper represents 10.2% of the paper waste stream, 4.1% of the MSW stream and its national recovery rate was 2.2% in 1988. [EPA, Characterization of MSW in US: 1990 Update, p. 10-13.]

UCRRA plans to develop an integrated program by which office paper can be recovered from all businesses and households, regardless of size or location. Like cardboard, high grade office paper may be generated in sufficient quantities to make it economically feasible for a business or institution to be able to market these materials directly. For many generators, however, these materials will need to be aggregated and centralized for recycling to be cost effective.

The Agency is currently coordinating a pilot office paper collection in the Ulster County Office Building. During the first two months of this program, 1.9 tons of office and computer paper were collected and marketed. Over the next few months this program will be phased in at all County offices; then it will be expanded to meet the needs of the commercial and institutional sectors. It is the goal of the UCRRA to assure that there is an opportunity for all offices to participate in an office paper collection program before mandatory legislation goes into effect.

Storage and collection methods can vary from boxes filled with office or computer paper left for curbside collection, to the use of large plastic or canvas

collection carts or gaylord boxes. Commercial or municipal haulers could collect paper, or businesses could deliver to MRDS or to the market directly.

As with all paper storage, fire prevention is an issue. Sprinkler systems, fire proof containers or storage sheds located at a specified distance from the building may be needed to meet safety codes and regulations.

Markets for high grades of office paper are favorable. 1990 prices per ton ranged from 0 to +$45/ton for loose high-grade office paper (file stock or mixed ledger) FOB Ulster County or +$15/ton to +$105/ton for baled office paper delivered to market. Computer print-out (CPO) ranged from +$50/ton loose FOB Ulster County to +$225/ton baled and delivered to market.

Many businesses and municipalities in Ulster County are marketing their office and computer paper to National Recycling of Marlborough, a local paper broker/processor, who offers destruction services for confidential material. The paper is shredded and then baled for domestic mills or export. National Recycling will pay $0 to +$30/ton for file stock and +$50/ton to +$80/ton for computer paper FOB, or more if the paper is delivered. NRC will collect from a site if the generator can store a ton or more, otherwise, it must be delivered. The UCRRA presently has a one-year contract with National Recycling for office and computer paper collected in the Ulster County Office Paper Recycling Pilot Project.

Many other markets exist and about 12 have responded to the Agency's request for "Expressions of Interest". (See Market List, Reference Section 12.4 of this document.) These will be further investigated prior to implementing a full-scale Countywide office paper program later in 1991.

Separating mixed office paper (file stock) into white or colored ledger and computer paper can significantly increase the potential revenues for these materials. Ulster County Association of Retarded Citizens (UARC), Gateway Industries, the NYS Department of Corrections (CORCRAFT), and the Office for Mentally Retarded and Developmental Disabilities (OMRDD) are potential resources for a labor force to upgrade office paper, as are the correctional facilities in the County. Discussions have already been initiated with UARC and the Department of Corrections regarding this possibility.

The issue of confidentiality is frequently raised with office paper recycling. Several points are important here. First, paper is no more vulnerable to unauthorized

inspection in a recycling container. Tearing is recommended over crumpling to save space in recycling bins. An investment in a paper shredder may indeed be necessary if confidentiality is a serious issue. Shredded paper can be marketed if it is free of contamination. If large amounts are shredded paper are generated in a Countywide program, baling will be required if it is to be transported any distance to market. As mentioned, destruction services are also available.

It is noteworthy that shredded office paper is already being used successfully in several New York State farm prisons as animal bedding.

4.2.4 OTHER PAPER/MIXED PAPER

The term "mixed paper" comes historically from the mixed paper trailers which waste paper processors would leave at businesses and municipal drop-off centers to collect various grades of paper. The processor would then transport the material to its facility, sort and upgrade it to end-market specifications, bale it, and resell as feedstock to mills which use secondary fibers.

In the late 1980's, due to increased labor costs, greater availability of paper from office paper and municipal collection programs and high levels of contamination from unsupervised drop-off programs, mixed paper collections stopped being an option. This occurred in 1989 and 1990 in Ulster County. Paper must now be presented to markets (brokers, processors, or mills) separated into different grades.

There are presently individual or overlapping markets for one or more of the following categories of paper: newspaper, corrugated cardboard, high grade office paper, and computer paper, as well as for direct mail ("junk mail"), magazines, phone books, boxboard or chipboard, brown bags (Kraft paper), and others. Soiled paper and books continue to be difficult to market and will have to be addressed later.

Commercial printing comprises 5.7% of the paper waste stream and 2.3% of the MSW stream. 14.6% of what is generated is recovered. "Junk mail" contains various grades of paper, including more than 50% higher grade office paper (white or colored ledger, file stock, etc.). In many offices and residential households, this high grade component is already being separated and diverted

as part of an office paper recycling program. However, lower grades of paper such as glassine window envelopes, coated or glossy paper, various circulars, catalogs, fax paper, and, in some collections, paper with self-stick labels (non-soluble adhesive), carbonless (NCR) paper, and other types of paper, are generally not yet being recycled and remain in the waste stream destined to be landfilled.

4.2.5 MAGAZINES AND "JUNK MAIL"

Marcal Paper, a manufacturer of tissue paper and towels in Elmwood, New Jersey, is accepting truckloads of gaylord boxes of magazines and junk mail delivered to the plant at no cost/no revenue. Presently, several Ulster County municipalities are developing contracts with Marcal, including New Paltz, Saugerties, and Woodstock, with Hurley bringing its junk mail to Saugerties. Marcal specifications include magazines, annual reports, catalogs, fax paper, MLS (Multiple Listing Service) real estate books, non-foil gift wrap, greeting cards, carbonless (NCR) paper, school paper with crayon, tissue wrap, glossy paper, window envelopes, construction paper and ream wrappings for copier paper, or other high-grade papers. Although magazines and junk mail are not listed in the materials being collected under the IMAs. UCRRA has surveyed the municipalities and found that there is interest in developing a Countywide contract for the collection of these materials. A pilot project would then ensue. Eventually, this material would be added to the recyclables listed under the IMA. Since Marcal is already supplied with over 50% of the material it needs to reach capacity by existing municipal contracts, UCRRA intends to act on this option in the near future.

The Laidlaw/Canadian Pacific proposal for newspaper (ONP) also included up to 35% magazines (OMG), which will be a necessary component of the proposed flotation de-inking process to be used in the Canadian mills. This option is also being explored.

4.2.6 PHONE BOOKS

Columbia Paper in N. Hoosic, New York and Barry Hull, Red Hook, New York, accepts phone books and chip board (box board) delivered at no cost/no revenue. The New York State Department of Economic Development (DED) is working with major phone book

publishers to encourage the use of soluble glue in bindings to increase their recyclability.

4.2.7 CHIP BOARD OR BOX BOARD

Columbia Paper also accepts this material. Most chip board or box board (the grey cardboard on back of note pads and writing tablets, cereal and tissues boxes, etc.) is already recycled from other paper products. It is easily recycled again by box board manufacturers, however, there is an abundance of other secondary fiber competing for these same markets. Food boxes, like all paper for use as secondary fiber, must be free of food or other contaminants.

4.2.8 BROWN BAGS (KRAFT PAPER)

This material can be marketed to some OCC markets. Some is presently taken by municipalities to the City of Kingston Transfer Station, compacted, and delivered with OCC to JC Paper. Depending on the market, this material may or may not include brown envelopes.

4.2.9 BOOKS

This material remains difficult to market. Research through the Carter Center and the Books-for-the-World Program indicates that US book publishers generate enough over-runs to supply third world countries with new books. Through these programs, publishers can earn tax credits for their donations. Recycling of old books and text books from schools, libraries, homes, and businesses remains problematic. Books and some magazines are bound with insoluble glued bindings. Hard-bound books may have cloth covers, which would have to be removed in order for the paper pages to be recycled. A process to remove these contaminants, using a saw or cutter designed for this purpose with trained personnel to operate it, should be considered in long-term planning. However, Barry Hull, Red Hook, New York, accepts this material.

4.2.10 SOILED PAPER

Paper contaminated with food, moisture, or waxed coatings cannot be used for recycling in the traditional sense,

but can be shredded and composted. This option will be evaluated with UCRRA's consideration of Municipal Organic Waste Composting.

Composting of paper will undoubtedly require a nitrogen source. If shredded paper is used as animal bedding then composted, the source is provided by manure.

Pennsylvania Cooperative Extension has done extensive research on the use of newspaper as animal bedding. Local Cooperative Extension agents and agricultural associations will be utilized to explore this option further with farms in Ulster County.

4.2.11 GLASS

Glass was 7% of the municipal waste stream in 1988, down from a high of 10.5% in 1975 due to the increased use of paper, metal, and plastic for packaging. Glass is highly recyclable, easily identifiable, and 12.0% is recovered nationally.

Color-separated container glass is a marketable commodity. Revenues for glass have changed very little over the past ten years and range from +$5/ton to +$15/ton for green (emerald), +$20/ton to +$40/ton for brown (amber), and over +$50/ton for clear (flint). Collecting glass in color-separated categories is more difficult than commingling, however, this is necessary to maximize income in the absence of sorting lines. The main use for mixed glass is as an aggregate in asphalt ("glassphalt"), but there is no revenue from glass used for this purpose.

Color-separated container glass (bottles and jars) must be free of the following contaminants: ceramic, clay, rocks, stones, asphalt, crystal, ovenware, light bulbs, mirrors, drinking glasses, visionware, and window pane. Glass is made of silica and soda ash and different chemicals are used to color glass, such as chromium or iron. Colored glass must therefore be kept separate to be recycled into new bottles or jars of the same color. Other chemicals are used to make window pane, thermopane, ovenware, etc. These additives, as well as, stones or ceramics, can cause defects in container glass, which may result in increased breakage during shipping or handling.

Pace Glass, an intermediate processor/broker, will accept 30-cubic yard roll-off loads of separated window pane, in addition to color-separated bottles and jars. Metal jar

lids or rings and paper labels are accepted by intermediate processors and end-markets with processing capability. It would not be economically feasible for the Agency to attempt to process glass to furnace-ready cullet, free of metal lids, rings, and paper labels.

The current IMA contract is with Pace Glass in New Jersey City, New Jersey. Options include collection by market in Ulster County or delivered to the Jersey City facility. Other options, including sending glass to the Owens plant in Volney (Fulton County), New York are being explored. The Agency will be evaluating the increased revenue versus the cost of transportation for the 6 to 7 hour round trip.

All the glass products that are listed above as contaminants, with the exception of window pane, are not presently able to be recycled. Manufacturing sources for these materials may be able to recycle their own discards. Auto pane, if collected in large enough amounts, may be marketed by scrap dealers.

4.2.12 METAL CANS

Markets for tin-plated steel cans and bi-metal cans (steel cans with aluminum tops) have improved markedly over the past few years. This is due in part to the use of the recently patented Cutler shredder (Cutler Used Can Preparation System), a system of processing which allows de-tinners and steel can processors to be able to accept a wider range of contaminants than previously was tolerated. This includes emptied paint and aerosol cans, paper labels, plastic, and food residue. In fact, the main contaminant presently is aluminum, which is so valuable that it is more cost-efficient to recycle aluminum cans separately from ferrous or steel cans. A few steel food or beverage cans are coated with zinc or chromium rather than tin ("tin-free steel" or TFS). This is of no concern to the industry.

De-tinners (AMG and Proler) remove the tin plating from food cans be bathing the shredded material in an electrolytic solution, through which a current is passed. There are no tin mines in the United States; all tin is imported except that which is reclaimed. Tin ingots, reclaimed by de-tinners, are of such pure quality that they can be used by the chemical and pharmaceutical industries. The scrap steel which results after tin cans

have been shredded and de-tinned is also of very high quality and valued by steel mills both domestic and foreign.

1990 process for steel cans range from +$5/ton for loose cans in Ulster County to +$70/gross ton delivered to an end-market in Pennsylvania.

An interim arrangement with Ellenville Scrap will allow the Agency to market mixed tin and aluminum cans, until a magnetic separator and baler is available in one or both SACs.

4.2.13 ALUMINUM CANS

Aluminum cans command the highest per ton revenue of all recyclables. In non-bottle bill states, this material subsidizes the costs associated with running recycling programs. In New York State, many aluminum cans are returned through the Returnable Beverage Container Law, however, some beverages, such as ice tea, lemonade, and chocolate flavored drinks, come in non-deposit aluminum cans. Certain food products, including pet foods, are also packed in non-deposit aluminum cans. However, there are some consumers who would sacrifice the deposit and recycle their aluminum cans with other metal cans if allowed to do so. The aluminum industry estimates that a municipality can expect to capture 1.5% of the recyclable portion of the waste stream as aluminum cans in a Bottle Bill State.

Alcoa is mainly interested in aluminum cans only, however, Reynolds will accept both cans and scrap (including foil, pie tins, siding, pots and pans, frames of lawn furniture, etc.) . Market prices in 1990 ranged from +$600/ton to +$1,000/ton for cans and +$200/ton to +$900/ton for scrap depending on transportation arrangements and densification. Aluminum is a very lightweight metal with twenty-eight empty aluminum cans to a pound, or 56,000 cans per ton.

Again, a magnetic separator and a can flattener or other densification equipment will be needed to efficiently process aluminum cans. Hand separation at the source is possible by use of a magnet (available on most can openers), however, this adds to the number of separations to be maintained either by the self-hauler or at curbside. Since this type of processing can easily be done mechanically with the proper equipment, it would be less desirable to ask residents to separate it. Both

major end-markets would be willing to provide a can flattener as part of their proposed contracts.

Recycling aluminum saves 95% of the energy required to make this material from raw bauxite. Recycling also greatly reduces pollution to land, water, and air resulting from mining and manufacturing raw material. With economic and environmental incentives to recycle aluminum, 60% of aluminum cans were recycled in 1989. [The Recycler's Handbook, The Earthworks Group, p. 32]

4.2.14 PLASTICS

According to Cornell's Waste Management Institute, less than 1% of plastics is presently being recovered, but plastics is the fastest growing recycling industry. PET (Polyethylene terephthalate, referred to as PETE in New York State) and HDPE (High-density polyethylene) comprise over 80% of all plastic bottles manufactured in the United States [Mark Ward, "Who's Buying Plastic?", Recycling Today, January, 1991, p. 53].

Recent implementation of the Society of the Plastics Industry's (SPI) standard plastic coding system has made resin identification must easier. Consumers can now simply invert the containers to determine the type of plastic. The coding system is as follows:

1 = PET
2 = HDPE
3 = Vinyl (V)
4 = LDPE
5 = Polypropylene (PP)
6 = Polystyrene (PS)
7 = "Other" includes nylon, polyurethane, polyester, etc.

However, the same resin may have different sub-types, such as blow-molded HDPE (used in making bottles) or injection molded HDPE (used for making margarine tubs). Each has a different melt index and different applications for secondary use. In this relatively new industry, market specifications can vary greatly. Working with a broker may prove advantageous for plastics recycling, especially early in the program.

Of the 15 resins by Franklin and Associates in the Characterization of Plastic Products in MSW - Final Report, February, 1990, p. 1-2, 5 resins represent

three-fourths of total plastics production. 61% of the 22 million tons of these resins produced in 1990, or 13.4 million tons, were disposed of in the MSW stream. These are listed in order of amount produced:

Low Density Polyethylene	= LDPE
Polyvinyl Chloride	= PVC
High Density Polyethylene	= HDPE
Polypropylene	= PP
Polystyrene	= PS

All but PVC are predominantly disposed of by residential, commercial, and institutional generators. (PVC is primarily from industrial or C&D uses.) Plastics are made from petroleum, a non-renewable resource, and should not be buried if this can be avoided. Plastics represent 7.3 to 8.0% of MSW by weight (18% by volume), with the plastics packaging component equal to 9% by volume. Like paper, but unlike glass and metal, the percentage of plastic in the MSW stream is projected to increase over the next ten years.

Markets are well established for HDPE and PETE bottles, separated by resin, with better revenues paid if separated by color. Lids usually need to be removed from bottles and discarded because they are made of a different resin. Baled materials are preferred over loose materials, but some markets will accept materials in bags or in gaylord boxes. Transportation costs require densification; shipping loose plastic is tantamount to shipping air. Several responses indicated interest in granulated plastic, but it must be ground to meet individual market specifications.

A few markets, including Clearvue and North American Recycling are brokers/processors who will accept various other resins, including polyvinyl chloride, polypropylene and polystyrene (rigid or foam), and may accept them mixed. These processors sort and upgrade into individual resins, then resell to end-markets. Trimax Lumber will accept mixed baled HDPE, PETE, PVC, and PP for use in mixed resin products.

Market negotiations are underway and agreements for marketing specific plastic categories are expected in mid-1991. The development of processing facilities (principally beneficiation and baling) for plastics will be undertaken as part of SAC system development.

Contamination of one resin by another is a serious problem in plastics recycling. The acceptable level of contamination for most resins is 3% or less, however,

PVC is a more serious contaminant with "0" levels listed in most specifications.

The ET-1 extrusion technology developed by the Center for Plastics Research at Rutgers creates a plastic lumber product which can utilize mixed or commingled plastics. The Council for Solid Waste Solutions (plastic industry association) has commissioned a market study to determine potential sales for products made of mixed recycled plastic. Rutgers is also developing an automatic sorting machine using light emitting diodes (LEDs) to sort plastics by resins. This technology is still in the R&D stage, with a few markets for mixed plastic starting to emerge.

The major demand is for resin-specific post-consumer plastic. Sorting at a SAC or at another facility will be necessary if plastics collected mixed at the MRDS are to be marketed in the short-term. As with paper, there are potential labor pools with such agencies as UARC or the local prisons that may be employed to upgrade plastics. Discussions with these agencies have been initiated and will continue as market negotiations proceed.

The challenge of the next few years for maximizing the recycling of plastics, as well as all other materials, will be to involve the commercial and industrial sectors.

- **High Density Polyethylene (HDPE) Plastic Containers** - HDPE containers are the most recyclable plastic product for municipal collections in a Bottle Bill state. "Raw" or "natural" HDPE is colorless and translucent and includes milk jugs and other dairy bottles, as well as juice, cider, and spring water containers and certain automotive product containers, such as antifreeze or windshield washer fluid. Colored (including white) HDPE containers are used for liquid laundry products, household cleaning products, motor oil and other automotive products, shampoo and beauty aids, and juices or other beverages. Some markets require that HDPE containers for automotive products be kept separate, especially motor oil containers which require special processing.

  Other uses for HDPE include clothing bags, food wrap, toys, housewares, pipe, milk crates, and pails. The 47,200 household recycling containers recently purchased by the Agency were made of recycled HDPE. HDPE makes up the base cup for one and two liter PETE soft drink bottles. The two resins are separated during processing by the

markets often by using flotation devices for the shredded materials.

HDPE plastic containers are an especially low-density, bulky material which require baling, shredding, or other densification for effective marketing.

HDPE markets are expanding, and capacity exceeds supply. Among the major end-users are Sonoco-Graham, Wellman, and OxyChem. HDPE plastic is included in the major materials to be collected under the SAC system. Revenues listed in the 1990 expressions of interest ranged from +$20/ton for loose to +$160/ton baled and +$240/ton ground FOB Ulster County.

Secondary products include plastic lumber, detergent bottles, motor oil containers, and drainage pipes.

- **Polyethylene Terephthalate (PET or PETE) Containers** - Soda and soft drink bottles are the major product through the Returnable Beverage Container Law. However, increasingly more non-deposit products are being packaged in PETE, such as cooking oils spring water, juices, and cleaning products. PETE bottle recycling was one of the earliest post-consumer plastics recycling technologies to be developed (early 1980's, St. Jude Polymer). Other uses of PETE include bubble packing material, photographic film, and oven-safe plastic food trays.

  Products made from recycled PETE include fiberfill for ski jackets and sleeping bags, industrial strapping, non-food containers, and paintbrush bristles. Proctor & Gamble has successfully introduced a Spic 'n Span bottle made from 100% recycled post-consumer PETE. WTE Recycling/Star Plastics of Albany, NY, is one of the largest post-consumer plastics recyclers in the United States, dealing primarily with PETE. Union Carbide is building a facility, Plastics Recycling Center, in Piscataway, NJ, for PETE bottles and bags. Demand already exceeds supply, and with both Pepsi and Coca Cola announcing plans to use recycled PETE in their 2-liter beverage containers, markets should remain favorable even after recycling becomes mandatory in New York State.

  PETE is the second plastic resin that will be collected under the IMA agreements. Prices quoted in the Agency's 1990 market search ranged from 0 to

+$80/ton for loose PETE bottles, +$80/ton to +$200/ton for baled PETE and +$200/ton for ground, FOB Ulster County.

- **Vinyl** - Polyvinyl chloride (PVC) represents only 4% of all plastics packaging and is used in bottles of cooking oils and baby oil, or as a meat wrapping and for some shrink wrap. PVC bottles are clear, but tend to have a bluish gray tint; they are more rigid than HDPE and have a line across the bottom seal. PVC pipe, conduit, cable, siding, and flooring are other major uses.

  Three major end-users of post-consumer PVC are Occidental Chemical (OxyChem), Goodrich, and Georgia Gulf. Occidental will pay for transportation of baled loads of one ton or more. Markets are favorable because demand exceeds supply, and there is much room for growth in the recycling of this resin. Markets for PVC will be researched in the present market negotiations and on an ongoing basis.

  Recycled PVC is used for artificial Christmas trees, wastewater treatment media, cooling tower fill, and construction and drainage products. Because these are durable, rather than disposable products (such as packaging or diaper liners), there is less available for recovery from the MSW stream. In commingled plastic recycling, PVC serves to strengthen plastic lumber products which can be used as fencing, decking material, and boat dock construction.

  While all plastics have high BTU values, concerns have been raised specifically regarding PVC (with chlorine as part of its chemical structure) contributing to dioxin emissions which result from incomplete combustion during incineration.

- **Polypropylene (PP)** - Plastic ketchup bottles, some bread and cheese wraps, plastic cereal box liners and drinking straws are examples of polypropylene products. It is also used in more durable goods, such as battery cases, appliances, pipe, and luggage. Several markets responded with interest, including Karta Container, a private, multi-material Materials Recovery Facility (MRF) in Peekskill, Westchester County, NY and Trimax.

- **Polystyrene (PS)** - Rigid polystyrene is used in the manufacturing of plastic utensils, food trays, tape

dispensers, and other hard plastic packages. Polystyrene foam is commonly used in egg cartons and food service containers and trays. Plastics Again of Leominister, Massachusetts, was subsidized by Mobil and Genpak to recycled food service styrene foam. Several schools, prisons, and other institutions in Ulster County are sending their used styrene foam to this facility through Damon Georgia of Genpak in Glens Falls, New York. McDonalds had planned to use this system, but has recently switched to all paper packaging.

Expanded polystyrene (EPS) packaging materials are somewhat more difficult to recycle. Local packing businesses are accepting clean foam packing chips or "peanuts" for reuse in shipping.

- **Low-density polyethylene (LDPE)** - Low-density polyethylene (LDPE) is used for film bags and wrappings, such as most shrink wrap or food wraps. If significant quantities are collected and baled, LDPE can be marketed. It is often manufactured, or re-manufactured, into plastic bags, such as trash bags.

  HDPE/LDPE film grocery bags are potentially recyclable. Several retail stores in Ulster County and surrounding counties have begun programs to collect plastic bags in their stores, with or without their own deposit system. Mobil and Amoco have sponsored major programs to recycle grocery bags. Local dry cleaners are also starting to participate in recycling programs for garment bags.

  Flexible bottles for glue or honey are made of LDPE, as are certain coatings for wire and cables. LDPE, first in resin sales (27% of 1988 domestic plastic resin demand), is produced in far greater quantities than is recovered. As with PVC, there is good potential for expanding the recycling of LDPE.

- **Other Plastics** - Nylon and polyester are included with textiles (see Section 4.2.19 of this document). Other recycling collections include plastic medicine bottles (which Mended Hearts Club sends abroad), and the potential for establishing film canister drop-off programs.

4.2.15 MARKETS FOR OTHER (NON-IMA) RECYCLABLES/COMPOSTABLES

A number of other materials have been identified as recyclable (either actually being recycled or having potential to be recycled). These include used motor oil, tires, C&D materials, auto and household batteries, scrap metal (including scrap aluminum), paint, textiles, other paper grades (such as junk mail and magazines, telephone books, brown bags, and chipboard), other plastics (PP, PS, PVC, LDPE, film, mixed and non-container), and mixed color glass and other glass (such as window pane), pallets, wood chips and various types of compost (yard waste, sewage sludge, food and compost resulting from municipal organic and/or municipal solid waste composting technologies). Various industrial wastes can also be reused or recycled and waste exchanges will be developed to facilitate this.

Under the present three-year IMA, any new recyclable materials would be added to the list of major materials upon mutual agreement between the Agency and the municipalities, and even then participation in the Countywide program would be on a voluntary basis for the term of the contract.

The list of major materials presently being recycled under the IMA is the same as the list of "Regulated Recyclable Materials" included in the Proposed County Mandatory Source Separation and Recycling Legislation. This "Law" provides a procedure for adding materials when a request is made or an economic market exists. The IMAs can be amended to include additional recyclable materials even if an economic market does not exist and the "Law" is not changed. This can be done by mutual consent between the Agency and participating municipalities.

Using input from the towns and City, the UCRRA will determine the need to market these materials based on quantity generated, current marketing arrangements, difficulty in marketing on a town-per-town basis, availability of markets, and market requirements. Most of these materials are being handled by some of the municipalities at this time. See Table 2-10b for a complete list of materials each municipality is currently recycling. For many of these materials it may be most expedient to maintain current arrangements. For others there may be an advantage to wither aggregating the material and processing or centralizing the market contracts.

The UCRRA will continue to survey markets and evaluate the municipalities' needs regarding these materials. Surveys will include the following:

- quantity and quality requirements
- contractual requirements
- transportation requirements
- processing and upgrading which may be necessary to assure market acceptance of the material (s)
- any current or future restrictions to developing this particular market

Consideration of these materials will be an ongoing process with the goal of adding as many as possible within the three-year term of the IMA. The County program will be re-evaluated at the end of that time.

- **Other Paper** - Markets for other grades of paper not included in the IMA materials are good for "junk mail" and magazines, and existing with minimal or no revenue offered for chipboard, phone books, and brown bags (craft paper), but are poor for text books and soiled paper (see Section 4.2.10). Markets will be secured as soon as it is feasible, at the request of the municipalities. Special processing may be required for books, especially with non-soluble glued bindings. Soiled paper is best composted.

- **Other Plastics** - Markets for resins other than HDPE and PETE will be evaluated in conjunction with current market negotiations and on an ongoing basis. The goal is to maximize the numbers and amounts of materials diverted from the waste stream.

4.2.16 SCRAP METAL AND WHITE GOODS

Scrap metal is the largest fraction of recyclable materials, by weight, of any municipal waste stream, with approximately 3,500 tons being recycled by Ulster County municipalities in 1990. Almost all municipalities are segregating scrap metal, although a few are stockpiling and have not yet marketed this material. Since the early 1980's local scrap dealers had been charging -$20/ton to -$30/ton for scrap metal, compacted on site in 20-ton loads or loaded into roll-off containers. Market arrangements were rarely formalized, and spot markets were more common than long-term contracts.

Recent concerns regarding PCBs in the capacitors of cooling and refrigeration units were resolved when regulations were clarified in 1989 regarding the applicability to white goods of the RCRA exemption for waste generated by households. With increasing competition for scrap steel, the price structure for municipalities changed dramatically in 1990. Charges were replaced at first with offers to remove white foods at no cost, them with offers of positive revenues for up to +$15/ton. The towns in Ulster County, generating an average of 200 tons per year of scrap metal, realized an increase in their highway, landfill, or recycling budgets for this material of -$4,000 to +$2,000 with a year.

Each municipality is presently making its own arrangements to market scrap metal and white goods. Several markets have given presentations to the Municipal Recycling Coordinators' Roundtable meetings. If there is an advantage to the municipalities in developing a Countywide contract for scrap metal, the Agency would consider doing this, if requested to do so. Should markets reverse and start charging again to collect scrap metal, such a request could happen.

Scavenging of more valuable metals, especially aluminum, copper, and brass, is still commonplace in Ulster County, with local dealers paying approximately +$0.20/pound for aluminum, +$0.75/pound for copper, and +$0.30/pound for brass. These prices change daily, as does the stock market. Stainless steel ranged from +$0.30/pound to +$0.70/pound in a recent six month period. Municipalities are encouraged to maximize their income by segregation of metals by type.

A recent note of environmental interest is that a Saugerties business, Especially Swedish European Auto Repair, now accepts freon for recycling from refrigerators and air conditions, or junk cars. This service is offered at no cost to the public and decreases the environmental impacts of releasing freon, an ozone depleting chlorinated fluorocarbon (CFC) into the atmosphere.

4.2.17 TIRES

Ten municipalities in the County are presently collecting tires for recycling, charging +$1.00 to +$2.00 per tire for this service. In 1990, 525 tons of scrap tire were marketed from Ulster County municipalities. This figure does not include the hundreds of tons marketed by businesses who sell new tires, or by commercial, institutional, and industrial sector directly. Each municipality makes its own market arrangements. Some markets will provide storage trailers, with rental fees of about $100/month, or will drop a trailer to be loaded by the municipality and hauled at a cost of $700 to 1,000 load. Other markets will collect at a cost of $1.00 per automobile tire or $1.50 to $5.00 per truck tire. Between 700 to 1,200 tires can be loaded into a covered box trailer depending on how efficiently they are stacked.

The UCRRA provides technical assistance and monitors the permitting status of potential markets. Several potential tire recycling systems for using tires in rubberized asphalt have made presentations, both to the

Hudson Valley Regional Council and to the Municipal Recycling Coordinators.

Markets for tire recycling have been limited. More are being collected than recycled. Tire recyclers were able to sell some tires to be recapped (mainly truck tires) or to be exported for reuse, but most were shredded for use as fuel, with in the United States or abroad. The domestic market for retread passenger tires is minimal. Most tires have either been landfilled (which is hampered by the tendency of tires to rise to the surface) or stockpiled in large storage facilities or stored in lagoons for future incineration. Oxford Energy is seeking permits to construct tire-to-energy facilities which use pyrolysis to generate oil, gas, and carbon black have been proposed in the mid-Hudson region. When tires are burned as fuel in energy recovery facilities, the technology is not deemed recycling because the material can no longer be used for the same or similar purpose.

Some non-incineration uses for scrap tires include products, such as rubber mats, washers, gaskets, and floor tiles. Tires have also been used in playgrounds, safety barriers and for erosion control. Good Year has been experimenting with artificial reefs made of tires, both to create breakwaters and to serve as storage until appropriate technology is developed for reuse of this material. Various other uses for the components of tires, such as sealants and rubber/plastic polymers are being researched.

The actual recycling of tires in New York State and nationally has been minimal. With supply exceeding market demands, tire recycling posed a very serious problem in New York State. The disastrous "1989 Catskill Tire Fire" in Greene County caused State and local officials to become aware of the threat this method of management poses. Many years of environmental protection were undone by this single disaster.

The most extensive use for tires as a secondary material will be as an asphalt aggregate in roadways. In late 1990, the New York State Department of Transportation (DOT) released its report on the "Use of Scrap Tire Rubber in Asphalt Pavements" as required by law, Chapter 599 of the Laws of 1987. The DOT's evaluation indicated that the use of rubber-modified asphalt would not be cost effective, requiring more labor to apply and longer hours to maintain equipment. The DOT's analysis did not allow the potential benefits of less long-term maintenance, increased road safety, and an alternative use for 12

million scrap tires New York State generates annually influence its evaluation.

A January, 1991 report by the staff of the New York State Legislative Commission on Solid Waste Management recommends "a Legislative Mandate of RUMAC (rubber-modified asphalt concrete) use through further routine use [of] scrap tires in asphalt paving applications on at least 50% of the annual State surfacing and binder course paving work [by the DOT and the Thruway Authority] by 1997". This is the kind of initiative needed to make tire recycling an economically feasible option for Ulster County and all of New York State.

Regulations for Waste Tire Storage Facilities are found in Subpart 360-13 of 6 NYCRR. Chapter 226 of the Laws of 1990, Waste Tire Transporting, added waste tires to the list of "regulated waste" in ECL 27-0303, effective January 1, 1991.

4.2.18 WASTE OIL, BATTERIES, AND PAINT

Waste oil, auto and household batteries, and paint are all potentially hazardous materials. The UCRRA is committed to developing a comprehensive program for the management of household hazardous waste and waste that is below regulatory limits (see Section 9.3.2 of this document). This will include the recycling of as much household hazardous waste as is feasible. This will also include the development and implementation of local waste exchanges, as well as the utilization by local businesses and industries of Statewide and regional waste exchanges (NYS Environmental Program Corporation's Industrial Materials Recycling Program [IMRA] and the Northeast Industrial Waste Exchange [NIWA]).

- **Waste Oil** - Subpart 360-14 of 6 NYCRR Part 360 regulates waste oil. Section 23-2307 of the used oil retention facilities regarding fire safety and spill prevention and containment for service stations or generators of at least 500 gallons per year. This law also requires that service stations accept used engine lubricating oil, in quantities not exceeding five gallons per day from any one individual, at no charge and "shall post a conspicuous sign open to the public view stating, "WE ACCEPT USED OIL FOR RECYCLING". Table 4-2 lists by town those service stations and MRDS that are presently collecting and recycling waste oil.

Most service stations in Ulster County are cooperating with the mandatory waste oil recycling program. In addition, many municipal recycling centers have made market arrangements and are accepting waste oil and storing it in 375 or 500 gallon tanks until collection from their sites. All municipalities and Municipal Recycling Coordinators (MRCs) have been advised of the ECL regulations and are in the process of modifying the waste oil collection facilities at their respective MRDS.

The municipal waste oil recycling programs in Ulster County recycled 8,575 gallons or 31.3 tons of used oil in 1990. Included in the 1990 figures is 1,000 gallons of waste oil collected at the July 9, 1990, Household Hazardous Waste Collection Day. Breslube USA (Safety Kleen), S&M Waste Oil, and Environmental Recycling Associates are the major markets. Centralized market arrangements could be made through the UCRRA, if requested; however, aggregating this material will not be necessary since the market collects it in specialized tanker trucks.

The UCRRA has developed a list of waste oil collection facilities (see Table 4-2). This will be updated on an continuing basis by the MRCs in cooperation with UCRRA.

Waste oil revenues or charges vary. In season (winter), there may be no charge for amounts over 200 gallons or a small charge. Revenues for quantities over 200 gallons have been offered in the past, and may be offered again, if imported oil prices rise significantly.

- **Batteries (Auto and Household)** - Like waste oil and tires, auto batteries are often recycled by service stations and auto centers. The Lead-Acid Battery Recycling Law, Chapter 152, Laws of 1990, mandates a deposit of $5.00 (a "return incentive payment") on all new lead-acid batteries sold in New York State. This deposit is waived if the consumer returns a used lead-acid battery at the time of purchase or it is refunded if a used battery is returned within 30 days of purchase. Retailers may keep any unredeemed deposits.

  Furthermore, this law prohibits the disposal of lead-acid batteries in mixed municipal solid waste, effective January 1, 1991. The municipalities in

TABLE 4-2
WASTE MOTOR OIL LIST

GARDINER
- o Gardiner Landfill/Recycling Center, Stevens Lane
- o Ireland's Corner Garage, Rt. 208, Gardiner (255-6797)

HURLEY
- o Hurley Landfill/Recycling Center, Dug Hill Rd. (338-5412)
- o Szymkovicz Service Inc., Rts. 28 & 275, West Hurley (679-2238)

KINGSTON (CITY)
- o Begnal Jeep Eagle, 515 Albany Ave., Kingston (331-5080)
- o Motorhead Garage, Boulevard, Kingston (331-3452)
- o Quick Lube, 802 Ulster Ave., Kingston (339-1474)
- o Szymkovicz Service Inc., Washington Ave., Kingston (338-5650)
- o Thruway Nissan, Rt. 28, Kingston (338-3100)

KINGSTON (TOWN) (to Quick Lube--see City of Kingston)

LLOYD
- o Lloyd Landfill/Recycling Center, Lily Lake Rd., Lloyd (691-8274)
- o Erichsen's Auto Service Center, Rt 299, Highland (691-8837)

MARBLETOWN
- o High Falls Garage (Mobil Service Station), off Rt. 213, High Falls (uses as fuel)

NEW PALTZ (TOWN)
- o New Paltz Solid Waste Management Facility, Clearwater Rd. off Rt. 32, 3 miles north of the village (255-5050 or 255-3749)
- o Chestnut Mobil, 3 N. Chestnut, New Paltz (255-5900)
- o New Paltz Auto Center, 87 N. Chestnut, New Paltz (255-0972)
- o Tantillos, Rt. 299 & S. Ohioville, New Paltz (255-6420)
- o Uppys' Service, 131 Main St., New Paltz (255-9851)
- o Zack's Auto Clinic, 160 Main St., New Paltz (255-6464)

OLIVE
- o Olive Landfill/Recycling Center, Beaverkill Rd. (657-8177)
- o C.A.R. Shop, West Shokan, NY
- o J & J Automotive, Rt. 28, Shokan (657-2299)
- o Paul's Service Center, Rt.28, Boiceville (657-2033)

PLATTEKILL
- o Modena Service Center, Rt. 32, Modena (883-7726)
- o Modena Texaco, Rt. 32, Modena (883-9338)

ROSENDALE (to High Falls Garage--see Marbletown)

ULSTER (TOWN)
- o Sears Auto Center, Hudson Valley Mall, Ulster (382-7228)

WOODSTOCK
- o Woodstock Landfill/Recycling Center, West Saugerties Rd. (679-6570)

Ulster County have been advised of this regulation and are encouraged to enforce it rigorously because all existing landfills are unlined and vulnerable to the toxic components of auto batteries: lead and battery acid.

Retailers and distributors are required to post signs displaying the universal recycling symbol and stating, "IT IS ILLEGAL TO DISCARD VEHICLE BATTERIES. STATE LAW REQUIRES US TO ACCEPT VEHICLES BATTERIES AT NO CHARGE FOR RECYCLING."

Auto batteries (1,430 or 27 tons) were recycled from Ulster County MRDS in 1990, generally collected by the market or by a dealer at no cost/no revenue. Most were marketed to Revere Smelting and Refining in Middletown, New York either directly by the municipality in minimum loads of 300-400 batteries, or through local scrap dealers. If delivered, RSR will pay the current rate based on the London Metals Market for lead ($0.035 per pound).

Household batteries, although a very minimal fraction of the waste stream, are also hazardous materials which should be kept out of local landfills. Mercury containing batteries are non-rechargeable and include alkaline and carbon zinc (D, C, AA, AAA, and 9-volt batteries) and mercuric oxide, silver oxide, and zinc air (button cell batteries). The battery industry has made a cooperative effort at source reduction, decreasing the amount of mercury used in the production of household batteries from 778 tons in 1984 to 62 tons in 1989. Nickel cadmium batteries are rechargeable and are used in cordless rechargeable products.

Household batteries were collected for recycling at the 1990 Household Hazardous Waste Collection Day and recycled through Mercury Refining of Latham, NY.

- **Paint** - Paint is often a reusable item that is best handled by informal swaps or waste exchanges. One municipal recycling program sets paint aside for reuse by a local farmer or it can be donated to a local pony club for painting fences.

Paint was another material recycled at the 1990 Household Hazardous Waste Collection Day in a cooperative research effort with Dutch Boy Paint.

Water-based paint (760 gallons) was collected for recycling, but an equal amount of oil-based or thickened acrylic was unacceptable for recycling.

4.2.19 USED CLOTHING AND TEXTILES

Most used clothing is recycled through small retail stores that sell second-hand clothing or through charitable organizations, including the Salvation Army, the People's Place in Kingston, Family of Woodstock and New Paltz, and various homeless shelters. Reuse is preferred over recycling, but textile recycling is an option that will be furthered explored.

Textiles include clothing, blankets, linens, and scrap material from the garment industry. Textiles are potentially recyclable if collected and baled. The capacity to store 10-ton minimum loads would be necessary for use by markets in New York City. Scott Cynamon Textiles, Inc. has expressed interest in purchasing textiles from Ulster County in these quantities. This company will also accept paired shoes, pocketbooks, and hand bags in separate bales.

4.2.20 CONSTRUCTION AND DEMOLITION DEBRIS (C&D)

Construction and demolition debris (C&D debris) is defined as the waste material which is the by-product of construction, demolition, refurbishing, revitalization, and renovation. These materials include wood, metals, and a mixture of concrete, asphalt, stone, brick, and block, commonly referred to as rubble. The rate at which C&D debris is generated is a function of both new construction and the level of refurbishing, revitalization and renovation activity taking place. Economic conditions also have considerable impact on the level of construction activities taking place.

For the most part, C&D debris generated in the County is currently collected separately by private carters. One minor exception is small amounts of C&D generated by homeowners through home improvement projects; these small amounts may be collected together with household refuse.

Because almost all of the C&D debris is already collected separately, there is no need to make changes to concurrent collection practices. High volume and easily separated materials for which markets currently exist

include wood, metals, and rubble (see DGEIS, Section 4.5). Other materials, such as stray textiles and industrial plastics would be difficult to recycle because they are not easily sorted, processed, and/or marketed. After sorting the wood, metals, and rubble, all other materials would be transported to the disposal site.

Various levels of effort may be required for processing, dependent upon both the quality of the materials collected and current market specifications. Because neither the future quality of the C&D debris nor future market conditions can be predicted, various processing scenarios are discussed.

Rubble can be used, without processing, as cover in municipal landfill closure operations, in compliance with NYSDEC regulations. With proper sorting, certain portions of the rubble may be used as clean fill. Further processing would include the crushing and screening of rubble. Once rubble is crushed and properly screened, it can be marketed commercially as aggregate for making asphalt or as fill.

It may be possible that mixed metals can be marketed unprocessed to scrap metal dealers. Additional sorting may be necessary to meet more stringent market specifications. Should large quantities of metals be generated, the County may find it desirable to bale the materials.

Markets may exist for unprocessed, clean, dry wood. However, more stringent market specifications require wood waste to be processed. After wood is chipped, the wood chips can be marketed as mulch, landfill cover, or used as a bulking agent in sludge composting.

The County's goal is to achieve 40% recycling of C&D waste by 1997. UCRRA recommends that collecting, processing, and disposing of C&D materials be hauled by the private sector with UCRRA having overall management responsibilities. In order to meet the goals outlined above and ensure a proper management of this material, UCRRA outlined a series of actions that must be taken. the measures are described in detail in Section 9.3.6 of this document.

4.2.21 FOOD WASTE

NY State Department of Agriculture and Markets regulates the use of food waste as feed for livestock. These

include dried apple pomace, aspirated grain fractions, dried bakery products, and dehydrated food waste. Materials must be dehydrated to a moisture content of not more than 12% and pathogen free (i.e., cooked).

Frederick Vogt of the Department of Agriculture reports that it is usually not cost effective to use waste kitchen food (from restaurant, hotels, or institutions) for animal feed because of the extent of processing that is required. Apple pomace is the exception and is reportedly commonly used as an animal feed supplement in Ulster County.

Offal, the waste parts of butchered animals, and cooking oils and fat are routinely collected by renders who convert this waste into fertilizer, cosmetics, and tallow for soap.

4.2.22 MARKETS FOR COMPOST

Compost is the stable, humus-like material which results from the natural process of aerobic (in the presence of oxygen), thermophilic (heat producing) decomposition of the organic material by the activity of micro-organisms. Household garbage is typically composed of about 70% organic (carbon-based materials, such as food and yard wastes and paper) material and 30% inorganic materials (glass, metal, and plastic). Much of both fractions are recyclable, but some is not. Composting the non-recyclable portions of the waste stream presents the opportunity for reuse rather than disposal by landfilling.

Two commonly used open composting practices include windrow composting and aerated static pile composting. In-vessel (indoor) systems included vertical and horizontal reactors and are usually followed by some further open static pole or windrowing phase of operations. Regulations for composting facilities are defined in 6 NYCRR Part 360-5.

- **Backyard Composting** - The simplest form of composting can be done by residents in their backyard, Food scraps, leaves, brush, and other yard and garden wastes are layered on a free-standing pile or in an enclosure made of a variety of materials: chicken wire, wood slats, brick, cement blocks, plastic lumber, or steel drums. These can easily be made or purchased. Providing that the material is not contaminated by toxic

herbicides or pesticides, it is easily reused on the premises as a yard and garden soil enrichment, enhancing soil nutrients and greatly increasing the soil's ability to retain water.

The UCRRA will develop a public education campaign to promote backyard composting to keep these materials from ever entering the waste stream (i.e. waste reduction). This will include instructions on how to prevent vermin and control odors, two major concerns often raised by the public.

- **Municipal Yard Waste** - This method of composting is slightly more technical and involves the composting of leaves, grass clippings, yard, and garden waste which have been brought by residents or businesses to municipal composting facilities usually located at the town landfill or MRDS. Each municipality continually evaluates their collection techniques and makes appropriate changes when necessary (see Section 2.5 of this document). Conditions of moisture and temperature are monitored by the staff and an appropriate schedule for turning the piles is developed. Approximately 18% of the national waste stream is leaf and yard waste.

  The UCRRA's decentralized yard waste composting program utilizing the Tub Grinder is described in detail in Sections 9.3.7 and 2.5 of this document. Two products result from this program. Wood chips (ground wood) which make an excellent mulch, and yard waste compost. Each municipality presently determines its own policy for use of this material. In some, residents may take wood chips or compost for their personal use; it may also be used by the municipality's parks or highway department as an excellent medium for promoting plant growth in disturbed areas or for landfill cover. A preliminary market analysis was done by RIS in 1989 prior to the purchase of the Tub Grinder. However, most municipalities are using the wood chips and compost locally and have not yet developed actual marketing strategies.

- **Food Waste** - Food scraps can easily be composted in small backyard systems, but larger amounts of food waste requires more controlled conditions. The Frost Valley YMCA's Composting Facility produces high quality compost which is used for their own greenhouse and gardens. Larger amounts of food waste would require an "in-vessel" municipal organic or solid composting facility.

- **Sludge and Co-composting** - Sewage sludge composting is a well-accepted technology in the United States with over 250 municipal sludge composting facilities in operation. Wood chips are often used as a bulking agent. Co-composting refers to the composting of two or more fractions of the organic portion of the waste stream simultaneously, one of which is usually sludge. Typically, co-composting refers to sludge, yard waste, and mixed solid waste which will be discussed below.

  Markets for sludge compost are well developed. Marketing is either done by the municipality or the facility operator or subcontracted to a professional marketing service. Testing is crucial to assure potential markets of the quality of the product.

  In Ulster County, sludge is mixed with daily cover to decrease the amount of cover material needed to be purchased. Sewage sludge is dried or dewatered at the sewage treatment facility and can have no greater than 20% moisture content to be used as landfill cover. The Ulster County Health Department advises against mixing sludge with wood chips and yard waste in an open facility because conditions may not be controlled sufficiently to assure pathogen control. Co-composting is better done in an in-vessel facility. Here, conditions can be monitored to assure that adequate oxygenation occurs and that temperatures are high enough for the required amount of time necessary to kill pathogens.

- **Municipal Organic Waste Composting (MOWC) and Municipal Solid Waste Composting (MSCW)** - There are basically two approaches to municipal waste composting. The first, municipal organic waste composting, composts only the organic fraction of the waste stream, separated at the source. This could include food waste, yard waste, sludge, and soiled paper from larger generators, such as restaurants and food processors, as well as organic waste from residents and businesses, if the compostable or organic fraction of the waste stream was collected separately from the inorganic fraction. This would require an additional separation; recycling already requires multiple separations. Whether or not this extra step would be advisable or feasible requires further investigation.

The other method, widely used in Europe and in other areas of the world, but a relatively new technology in the United States, is municipal solid waste composting. Some early attempts at MSWC allowed most components of MSW to be collected in a commingled manner and then separated on a tipping room floor.

Ideally, a MSWC program would require the source separation of recyclables and hazardous material before collection of the remaining mixed solid waste. The solid waste is scrutinized on the tipping floor for any contamination by hazardous or larger non-compostable materials and then mixed with sludge and composted. During the composting process, the organic fraction is separated from the inorganic fraction by screening. The organic fraction is then further composted in windrows or aerated static piles; the inorganic residual and the bypass (that material which was pulled out on the tipping floor) are then landfilled. This process is simpler from the collection perspective and addresses a potentially wider fraction of the waste stream, but has the potential disadvantage of producing a lower quality compost.

Various vendors of the MSWC technology use different types of processing equipment. The more the MSW feedstock is shredded or pulverized before it is mixed with sludge, the more difficult it is to separated the organic from the inorganic fraction and the lower the quality of the resulting end product.

- **Uses for Compost** - Compost is a highly valuable organic soil conditioner with many potential uses.

- **Municipal Uses** - Road and park construction and maintenance by public works departments. Compost can be used for final grading and mixed with topsoil to help establish vegetation and reduce erosion.

  Landfill cover material. Compost can be mixed with daily cover material to reduce the cost of cover material. Although this is a low-grade use, it is a beneficial one.

  Landfill closure material. All fifteen remaining landfills in Ulster County are under consent order to close or upgrade in the next few years. If testing indicated suitability of the material,

compost could be used in the 24" barrier protection layer [6 NYCRR Part 360-2.139(r)] and mixed with topsoil for the 6" layer of final cover [6 NYCRR Part 360-2.13(s)]. New Paltz has already successfully used sludge compost for this purpose.

- **Agricultural Uses** - Dr. Richard Kashmanian, of the United States Environmental Protection Agency's Office of Policy, Planning, and Evaluation believes that one of the biggest markets for clean, high quality compost will be the American farmer. A major use of compost will be to prevent or minimize soil erosion, one of the most serious environmental problems for United States croplands. Tom Richards of Cornell Waste Management Institutes agrees that agricultural uses are of major importance. Rangelands are also plagued with soil erosion and could beneficially use quality compost. Agricultural uses require Class I compost, and are limited to food chain crops that will be processes, not consumed directly, because of concerns regarding pathogen transmission.

- **Horticultural Uses** - Nurseries, greenhouses, and landscape contractors are excellent potential markets for compost. Non-food uses of compost, including lawn and flower gardens, can utilize either Class I or Class II. Sod farms and golf courses are also potential markets Sewage sludge compost is already widely used for these purposes.

- **Land Reclamation and Reforestation** - Sand and gravel pits and other mining operations can use compost for reclamation and revegetation. In areas cleared for timber operations or construction, compost can be used to promote reseeding.

- **Compost Quality** - Class I compost can be distributed for use by the public on food chain crops and for other horticultural uses, but cannot be used on crops grown for direct human consumption [6 NYCRR Part 360.5(p) (1)].

  Class II compost can be used only on non-food chain crops [6 NYCRR Part 360.5(p) (2)].

  Compost producers must consider end-market specifications just as seriously as is required for other recyclables. Nitrogen-rich composts made with manure or clean sewage sludge will be preferred by farmers. Home gardeners will want compost that has been screened to remove small

pieces of glass and plastic. Compost used for revegetation of construction sites or landfill cover can be of a lower grade.

- **Regional Sludge Study** - In 1985, the Hudson Valley Regional Council (HVRC) asked the New York State Environmental Facilities Corporation (EFC) to study sludge management alternatives in the region. This report entitled, "Sludge Management Alternatives for Six Counties in the Hudson Valley", provides information for evaluating the potential for sludge and/or municipal waste composting.

The Orange County Solid Waste Plan includes a chemical analysis of their solid waste field sampling and noted that the combined yard and food waste subfraction had higher concentration of heavy metals (mercury, lead, nickel, copper, and zinc) than did the overall mixed household fraction. The sampling was a negative sort with paper, plastic, glass, and metals removed first, but with small pieces of these materials left with the remaining food/yard waste component. This data more clearly resembles what could be expected from the commingled municipal solid waste composting approach than from the source separation municipal organic waste composting approach.

Research on the use of magazines in compost indicates that levels of heavy metals from inks are less than backyard levels present in soil. Other research has found that the degradation of organophosphate pesticides and other organic chemicals is accelerated by composting.

Many questions remain unanswered, but the potential for reuse of organic materials by composting for serious evaluation of each of these methods of waste management. UCRRA plans to undertake this evaluation during the next year and a half. For a detailed discussion, the reader is referred to Section 9.3.7 of this document.

In addition to the levels of heavy metals and PCBs, other criteria for determining the quality and marketability of the compost product include carbon-to-nitrogen ratios, nutrient levels, particle size, level of pathogen destruction, and compost maturity. Assessing salt content and scanning for radioactive materials may also be required for commercial use.

4.2.23 MULTI-MATERIAL MARKETS AND MARKET SERVICES

- **Commingled Containers** - Ulster County Sanitation (UCS) is planning to collect commingled recyclables and sort them at its facility prior to bringing them to the designated Agency Satellite Aggregation Center(s) (SACs) to be aggregated and marketed with the separated recyclables from the MRDs. UCS has indicated that they would provide this sorting service to other haulers who prefer to collect recyclables. Karta Container in Peekskill also has this sorting capability, but charges a processing fee for the service.

- **Multi-Materials Markets** - Empire Returns, Fox Run, Karta Container, and North American Recycling are among the markets who are processors of and brokers for a wide range of materials. In the UCRRA's recent market survey, it was found to be more cost effective to use end-markets and specialized brokers. This may not be the case for plastics and/or cardboard.

4.2.24 SUMMARY OF MARKET SURVEY

Tables 4.3a and 4.3b summarize the market research done by the Agency. Table 4.3a focuses on major recyclable materials, those which are included in the Intermunicipal Agreements (IMA), and those which are to be designated under the Proposed Mandatory Source Separation and Recycling Law as "Regulated Recyclable Materials". This market research helps to fulfil the conditions of the IMA by defining the Agency's responsibility to "provide services as an agent for municipalities in...marketing all recyclable materials processed [in the SAC System]" and to "...secure long term market agreements for the disposition of the recyclable materials delivered to the SAC [System]".

Table 4.3b focusses on "non-IMA" or miscellaneous recyclables. Many of these materials are already being recycled by local municipalities and businesses in Ulster County.

This survey represents a compilation of responses to the Agency's requests for Expressions of Interest, Agency market negotiations, and other market information acquired during the market research. Marketing is an ongoing process. Markets and "back-up" markets are needed for all potentially recyclable materials. This survey and the UCRRA Market List included in the References, Section 12.0 of this document, will be continuously updated, and are available to Ulster County businesses to support their direct marketing efforts.

Also included in the survey is data gathered from the municipalities regarding markets they are using or have used for direct recyclable materials marketing. Information has been requested on an ongoing basis from Municipal Recycling Coordinators (MRCs) and UCRRA Market Lists have been circulated frequently for their review.

Additional sources of data include: Resource Integrated Systems (RIS), Recycling Consultants; Businesses and Institutions; County Municipal Recycling Coordinators; and other marketing experts. Selected entries from the Department of Economic Development Office of Recycling Market Development Market List, dated February 8, 1991, have also been included.

It is important to emphasize that this information was gathered over several years and that the prices listed in the UCRRA Market Survey, Table 4.3a and 4.3b, reflect information obtained during the period from July, 1990 through May, 1991. During this time, market conditions fluctuated greatly. A potential market that responded during a more favorable time may have submitted a less favorable response in a later phase of market research. All of this was considered in actual selection of markets, but readers are cautioned against making any strict comparisons of prices submitted over this wide range of time.

Clarification of the terms used to describe type of market are as follows:

- **A broker** purchases recyclables for resale or export. A broker may or may not provide transportation, but generally does not process the materials.

- **A processor** does beneficiation of the recyclable materials, such as sorting or separating, cleaning, baling, granulating, shredding, or other processing before reselling the materials, usually to an end-market.

- **An end-user**, such as a paper mill, detinner or smelter, glass furnace, etc., uses the recyclable materials in place of raw or virgin materials for the manufacturing of salable products.

Table 4-3a: UCRRA Market Survey (Major Materials)
ALUMINUM CANS AND ALUMINUM SCRAP

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Terms	Type of Market
Alcoa Recycling Co., Inc.	Loose, flattened, or whole densified or baled aluminum food and beverage cans	Confidentiality requested	Ulster Co. or Edison, NJ	negotiable; flattener and trailer leasing arrangements avail.	End-User
All-Container Recovery, Inc.	Baled or loose aluminum cans and baled scrap	Cans: $800 - 1,000 Scrap: $600 - 900	Ulster County	1 year	Broker/processor (multi-material)
J. Bass and Sons	Aluminum cans, with glass collection	Not specified	Ulster Co.	with glass contract; 2 years (price varies)	Broker
Ellenville Scrap Iron and Metal Company	Aluminum scrap	Not specified; based on American Metal Market	Ulster Co. or Ellenville, NY	1 year	Broker/processor
Fox Run Recycling	Baled aluminum cans and scrap	Cans: $740 (picked up) $780 (delivered) Scrap: $620 (picked up) $660 (delivered)	Ulster Co. (baled)	1-5 years	Broker (multi-material)
Hudson Baler	Loose or bagged aluminum beverage cans	Cans: $800	Newburgh, NY	negotiable	Processor (multi-material)
J.C. Paper Co., Inc.	Loose or baled aluminum beverage cans	Not specified	Ulster Co. or Poughkeepsie, NY	negotiable	Processor (multi-material)
Karta Container	Loose aluminum cans and scrap	Cans: $600 - 800 Scrap: $200 - 300	Peekskill, NY	negotiable	Processor (multi-material)
Metals Unlimited	Aluminum cans or scrap	Not specified	Ulster Co.	negotiable	Processor
B. Millens	Loose aluminum cans and scrap	Cans or scrap: $700 ($0.35/lb.)	Kingston, NY	negotiable	Processor
Pace Glass	Crushed or uncrushed aluminum cans (with glass)	Not specified	Jersey City, NJ	negotiable	Processor

* Prices listed were quoted over time period from July, 1990 to May, 1991, and may vary with market fluctuations.

Table 4-3a: UCRRA Market Survey (Major Materials)
ALUMINUM CANS AND ALUMINUM SCRAP

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Terms	Type of Market
Reynolds Aluminum	Loose, baled or boxed aluminum cans and scrap	Cans: $800 (picked up) $900 flattened (del.) $940 baled (del.) Scrap: $600 - 1,100	Ulster Co. Hartford, CT " "	negotiable	End-User
Rochester Aluminum Smelting Company	Loose, flattened, boxed, baled or shredded aluminum cans and aluminum scrap	Cans: $960 Scrap: $660	Rochester, NY	not specified	End-User
RRT Empire Returns Coporation	Flattened or baled aluminum cans	Baled cans: $949 Flattened: $860 (price includes freight and RRT commission)	Bedford, Indiana Ulster Co., NY	3 years minimum; RRT commission is $-80/ton	Processor (multi-material)

* Prices listed were quoted over time period from September, 1990 to May, 1991, and may vary with market fluctuations.

Table 4-3a: UCRRA Market Survey (Major Materials)
GLASS

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Terms	Type of Market
J. Bass & Sons	Glass bottles and jars, separated or mixed; trailer and transporation provided	Clear: 0 - $10; green or brown: -$20 to +$5 Commingled colors: -$40	Ulster Co. sites " " " " " "	2 year contract; -$50 to - $100 transp. fee for <30 cu. yds./mo.	Broker
Eveready Beverage (now Metro Mining)	Color-separated glass bottles and jars	0 delivered	Saugerties, NY	negotiable	Broker
Hudson Baler	Color-separated glass jars and bottles	All: $16	Newburgh, NY	negotiable	Processor (multi-material)
Karta Container & Recovery	Flint, amber, and green glass	Flint: $20 - 30 Amber: $20 - 30 Green: $ 5 - 15	Ulster County " " " "	negotiable	Processor (multi-material)
Owens - Illinois	Color-separated brown, clear, and green glass	Clear: $40 - 50 Brown: $40 - 50 Green: $10	Fulton, NY " " RRT, Syracuse, NY	2 year	End-User
Owens - Brockway	Whole or broken color-separated clear, brown, or green glass	$50 - all three colors, delivered to plant that processes each	Clear or brown: Volney (Fulton); green: Atlanta, GA $5/ton freight allowance	not specified	End-User
Pace Glass, Inc.	Crushed or uncrushed color-separated flint, green, or amber glass; window pane (in separate loads)	Flint: $35; Amber: $25 Green: $17.50 Window pane: $25 Flint: $20; Amber: $10 Green: $10 Window pane: $12	Jersey City, NJ " " " " " " Ulster County " " " "	2 - 3 years	Processor
Recycle Recovery	Color-separated glass	Flint: $8; green/brown: 0	Montgomery, NY	negotiable	Broker
RRT Empire Returns Corp.	Color-separated flint, amber, and Georgia or Emerald green glass	Flint cullet: $32 Amber cullet: $28 Green cullet: -$12 (net price after freight and RRT commission)	Ulster County; price includes freight to Syracuse, NY	3 years, minimum; RRT commission is -$3.00/ton	Broker/Processor (multi-materials)

* Prices listed were quoted over time period from July, 1990 to May, 1991, and may very with market fluctuations.

Table 4-3a: UCRRA Market Survey (Major Materials)
NEWSPAPER

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Term	Type of Market
American Independent Paper Mills Supply Company, Inc.	Baled #6 news	not specified	Ulster Co. or Tarrytown, NY	negotiable	Processor
Formisano Recycling	Loose newspaper	0 (trailer and transportation provided)	Ulster Co. sites	negotiable	Processor
Fox Run Recycling	Baled or loose #8 news	$0-5 (picked up) $15-20 (delivered)	Ulster County	1-5 years	Processor (multi-material)
Garden State Paper Company	Loose #8 news	$15-25	Elmwood, NJ or other specified center	5 years	Processor (multi-material)
J.C. Paper Co., Inc.	Baled or loose newspaper, magazines, and other glossy paper	#6 news: -$15 (baled) -$35 (loose) #8 news: -$10 (baled) -$30 (loose)	Ulster Co. (baled) or Poughkeepsie, NY (loose)	negotiable	Processor (multi-material)
Karta Container & Recycling	Loose #6 or #8 news, mixed paper/magazines, and kraft paper products	#8 news: $0 #6 news: -$25 mixed: -$25 kraft: $10 - 12.50	news: not specified other: Peekskill, NY	negotiable	Processor (multi-material)
Kruger Inc.	News and other waste paper	not specified	Albany, NY	negotiable after April, 1991	Processor/end-user (Canadian mill)
Laidlaw Resources	Baled, separated #6 news and magazines	$25 ($5/ton to be held in escrow for 5 years)	Ulster Co.	10 year minimum (with penalties)	End-user (Canadian Pacific)
Paper Trade USA, Inc.	Baled #6 news	$11/short ton (del.) $9/short ton (picked up)	Ulster Co. or Port Elizabeth, NJ	not specified	Exporter

* Prices listed were quoted over time period from July, 1990 to May, 1991, and may vary with market fluctuations.

Table 4-3a: UCRRA Market Survey (Major Materials)
NEWSPAPER

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Term	Type of Market
Red Hook Paper	News, some cardboard without tape or staples, phone books	News: 0 to -$10 (del.) Cardbd., phone books: 0	Red Hook, NY	not specified	End-user
RRT Empire Returns	Baled #6 or #8 news	Baled #6 news: -$9.36 Baled #8 news: -$4.39 (price includes freight and RRT commission)	Port Elizabeth, NJ " " "	minimum 3 years; RRT commission is -$5.00/ton	Broker/processor (multi-material)

* Prices listed were quoted over time period from July, 1990 to May, 1991, and may v ith market fluctuations.

Table 4-3a: UCRRA Market Survey (Major Materials)
CORRUGATED CARBOARD AND KRAFT BAGS

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Term	Type of Market
American Independent Paper Mills Supply Company, Inc.	Baled OCC	$15 - 27.50	Ulster County or Tarrytown, NY	negotiable	Processor
Chesterfield Paper Company, Inc.	Baled OCC and kraft bags	both: $10	Ulster County	5 year minimum	Processor
Cornwall Paper	Baled OCC from established commercial accounts only	not specified	Ulster County	not available	End-user
Domtar Packaging	Baled #11 OCC	$25 - 35	Ulster County	5 to 10 years	End-user
Formisano Recycling	Baled or loose OCC	loose: $0 - 30 (del.) after baler installed (July, 1991)	Newburgh, NY or Milton, NY	not specified	Processor
Fox Run Recycling	Baled #11 OCC	$16 - 21 (picked up) $25 - 30 (delivered)	Ulster Co. North Branch, NY	1-5 years	Processor (multi-material)
Hudson Baler	Loose OCC	not specified	Newburgh, NY	negotiable	Processor (multi-material)
J.C. Paper Co., Inc.	Loose or baled OCC	$15 - 20 (baled) -$15 (loose)	Ulster Co. (baled) or Poughkeepsie, NY (loose)	negotiable	Processor (multi-material)
Karta Container & Recycling	Loose OCC	$0 (loose)	not specified	negotiable	Processor (multi-material)
National Resource Recovery	Baled or bundled OCC	$20 (baled) $0 (bundled)	Ulster County (baled) Marlborough, NY (bundled)	2 year minimum	Processor
North American Recycling	Baled or compacted OCC	not specified	Port of Albany, NY	negotiable	Processor

* Prices listed were quoted over time period from July, 1990 to May, 1991, and may vary with market fluctuations.

Table 4-3a: UCRRA Market Survey (Major Materials)
CORRUGATED CARBOARD AND KRAFT BAGS

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Term	Type of Market
Paper Trade USA, Inc.	Baled #11 OCC	$11 - 31/short ton	Ulster Co. or Port Elizabeth, NJ	not specified	Exporter
Reclamation Industries	Loose, palletized or compacted OCC	not specified	Delmar, NY	not specified	Processor
Red Hook Paper	OCC - very clean, without tape or staples, in small amounts	0	Red Hook, NY	not specified	End-user
RRT Empire Returns Corporation	Baled #11 OCC	$23.61, includes RRT commission and freight	Port Elizabeth, NJ	3 years minimum RRT commission is -$5.00/ton	Broker/processor (multi-material)
Sonoco Products	Baled OCC (also baled ONP)	$25 delivered	Amsterdam, NY	not specified	End-user
Stone Container	Baled OCC from established commercial accounts only	$45 to established accounts (del.)	Uncasville, CT	not available	Processor
Yank Waste Co., Inc.	Baled or boxed OCC	charge (not specified)	Ulster Co. or Albany, NY	negotiable	Processor

* Prices listed were quote over time period from July, 1990 to May, 1991, and may with market fluctuations.

Table 4-3a: UCRRA Market Survey (Major Materials)
OFFICE AND COMPUTER PAPER: HIGH GRADES

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Term	Type of Market
American Independent Paper Mills Supply Company, Inc.	Baled or loose office waste and computer paper	Office: $45 - 105 Computer: $175 - 225	Ulster Co. or Tarrytown, NY	negotiable	Processor
Chesterfield Paper Company, Inc.	Baled office waste and computer printout (laser)	Office: $15 Computer: $150	Ulster Co.	5 year minimum	Processor
Domtar Packaging	Baled and separated colored and white ledger, computer printout and mixed office paper; no fax, carbon or windows; outthrows <2%	Not specified (as per Yellow Sheet)	Ulster Co.	5 to 10 years	End-user
Formisano Recycling	Various grades of office and computer paper; also low grades	Computer: $60 - 80 Office: 0 (picked up) up to $25 (delivered)	Ulster Co. or Milton, NY or Newburgh, NY	negotiable	Processor
Fox Run Recycling	Baled #40 white ledger and #42 computer paper	Computer: $140 - 150 White ledger: $60 -70	Ulster Co.	1-5 years	Processor (multi-material)
J.C. Paper Co., Inc.	Baled or loose computer printout (laser or laser free) white and mixed ledger	CPO: $120 - 170 (baled) $80 - 140 (loose) White: $100 (baled) $20 - 70 (loose) Mixed: $75 (baled) (color) $ 0 - 45 (loose)	Ulster Co. (baled) or Poughkeepsie, NY (loose)	negotiable	Processor (multi-material)
Karta Container & Recycling	Loose computer printout (laser or laser free) white and mixed ledger	CPO laser free: $150 CPO laser: $70 White ledger: $60 - 80 Mixed ledger: $50 - 70	Peekskill, NY	negotiable	Proceesor (multi-material)
Kruger Recycling	Office and computer paper	Not specified	Albany, NY	negotiable	Processor/end-user

* Prices listed were quoted over time period from July, 1990 to May, 1991, and may very with market fluctuations.

Table 4-3a: UCRRA Market Survey (Major Materials)
OFFICE AND COMPUTER PAPER: HIGH GRADES

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Term	Type of Market
National Resource Recovery (National Recycling) [closed May, 1991]	Baled or loose, separated office amd computer printout	Office: $0 - 40 Computer (sulfite): $50 -70 Computer (groundwood): $0 - 20	Sites in Ulster Co. -$100 penalty if load < 1 ton; add +$10/ton if delivered to Marlboro, NY	2 year minimum	Processor
Paper Trade USA, Inc.	Baled #42 computer paper, sorted white and colored ledger	Computer: $180 - 200/ short ton White: $115 - 135/short ton Colored: $95 - 115/short ton (higher prices paid FOB Port Elizabeth)	Ulster Co. or Port Elizabeth, NJ	not specified	Processor
Reclamation Industries	Computer printout; white or colored ledger; loose in gaylords (will replace gaylords)	Laser-free CPO: $70 - 100 CPO with laser: $60 - 85 White ledger: $50 - 65 Colored ledger: $30 - 40	Delmar, NY	not specified	Processor
Recycle Material, Inc.	Colored and white ledger, office waste and computer printout. Will supply hampers and provide transportation.	Laser-free CPO: $60 White ledger: $40 Office waste: 0 Add $10/ton, if delivered	Ulster Co. " " Port Chester, NY	2 years	Processor
RRT Empire Returns Corporation	Office/computer paper (specs. not available)	Not specified	Ulster County or Syracuse, NY	3 years minimum	Processor (multi-material)
Yank Waste Co., Inc.	Baled or boxed office waste and computer printout	Office: $20-50 Computer: $145-165	Ulster County or Tarrytown, NY	negotiable	Processor

* Prices listed were quoted over time period from July, 1990 to May, 1991, and may fluctuate with market fluctuations.

Table 4-3a: UCRRA Market Summary (Major Materials)
PLASTICS

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Terms	Type of Market
Bronx 2000	Various resins, separated by type	not specified	Bronx, NY	negotiable	Processor
Clearvue Resource Management Ltd.	Baled or bagged, mixed or sorted PET, HDPE, PP and PVC	HDPE: $20 (loose) $65 to 100 (baled) PET: $0 (loose) $80 (baled) others: $0 to 10 (loose) -$35 to 80 (baled)	Amsterdam, NY	1 to 5 years	Processor
CVM Plastics, Inc.	Baled PETE and HDPE	market price (RECOUP monthly News letter)	Ulster County or Asbury, NJ	negotiable	End-User
Day Products	Baled PET	PET clear: $160 green: $120; mixed $140	Ulster County	30 days to 1 year	End-User
Eaglebrook Plastics, Inc.	Granulated or baled PET and HDPE	PET: $140 (baled) $160 - 220 (ground) HDPE: $120 - 160 (baled) $200 - 240 (ground)	Ulster County	not specified	End-User
Fox Run Recycling	Baled PET and HDPE	PET: $40 - 80 (picked up) $80 - 120 (delivered) HDPE: $20 - 40 (picked up) $60 - 80 (delivered)	Ulster County	1-5 years	Processor (multi-material)
Hudson Baler	Loose separated PET bottles and HDPE bottles and jugs	PET: $60 - 80 HDPE (natural): $80 HDPE (color): $40	Newburgh, NY	1 year or more	Processor (multi-material)
J.C. Paper Co., Inc.	Loose or baled PET, HDPE, LDPE. No motor oil containers; no PVC.	not specified	Ulster County (baled) Poughkeepsie, NY (loose)	negotiable	Broker (?) (multi-material)
Karta Container & Recycling	Loose PET, HDPE, Vinyl, PP, and PS	PET: $80; HDPE: $50 - 80 Others: $50	Peekskill, NY	negotiable	Processor (multi-material)
MA Industries, Inc.	Baled PET and natural HDPE	no price quoted	Ulster County	not specified	End-User
Nicon Plastics, Inc.	Baled PET	PET: $160 - 200	Ulster County	3 years	End-User

* Prices listed were quoted over time period from July, 1990

Table 4-3a: UCRRA Market Summary (Major Materials)
PLASTICS

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Terms	Type of Market
North American Plastics	Loose or baled PET, HDPE, PVC, PP, or #7 ketchup bottles only	PET: $60 PP: $40 HDPE (clear): $80 HDPE (color): $40 PVC: $40 #7K: 0 Mixed 1,2,3,5,7K: $40	Port of Albany, NY	1 year, with option to renew	Processor
Occidental Chemical	Baled PVC	PVC: $120 - 200	Ulster County	negotiable	End-User
Plastics Recovery Corp.	Baled HDPE and PET containers	HDPE-natural: $140 - 160 color: $120; mixed: $100 PET (clear): $200 PET (mixed): $170 HDPE and PET (mixed): $80	Ulster County	1 year	Processor
Plastics Recycling Alliance	Baled HDPE and PET containers	not specified	Ulster County	3-5 years	End-User
Reclamation Industries	Baled or loose, PET, HDPE (natural and color, separated)	HDPE or PET: $ 60 - 100	Delmar, NY	negotiable	Processor
RRT Empire Returns	Baled PET or HDPE	Baled PET: $140 Baled mixed HDPE: $78 Baled natural HDPE: $128	Ulster Co. York, PA York, PA	minimum 3 years (price includes -$20 commission and freight)	Broker/processo (multi-material
Trimax Plastic Lumber	Baled mixed plastic bottles (HDPE, PET, PVC, PP)	$60 - 85 commingled $100 baled HDPE	Ronkonkoma, NY	1-5 years	End-User
Union Carbide	Baled HDPE and PET (may take LDPE in future)	PET-clear: $200 green: $140; mixed: $160 HDPE (natural): $220 - 260 HDPE (color): $180 PET/HDPE (mixed): $100	Piscataway, NJ	negotiable	End-User
Wellman, Inc. New Jersey	Baled, separated or mixed, PET and natural HDPE	PET: $160 natural HDPE: $140 - 160 commingled: $100 - 120 (depends on mix)	Ulster County	negotiable	End-User
Wellman, Inc. Pennsylvania	Baled, separated or mixed, PET or HDPE bottles	PET: $160; HDPE: $100-160 Mixed PET and HDPE: $100	Ulster County	negotiable	End-User

* Prices listed were quote er time period from July, 1990

Table 4-3a: UCRRA Market Survey (Major Materials)
STEEL CANS

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Terms	Type of Market
AMG Resources Corporation	Loose, flattened, or loosely baled steel, bi-metal, non-hazardous aerosol cans and one-gallon containers	$129/gross ton, tied to market index: "Iron Age" #1 dealer bundles, Phila. 2nd week ($55/GT Baltimore; $27/GT Kingston)	(-$74) Baltimore, MD (-$102) Kingston, NY truck or rail; freight @ $28/GT	2 - 3 years	End-User (detinner)
Bethlehem Steel Corporation	Compressed steel and bi-metal cans	$70/gross ton	Bethlehem, PA	1 year	End-User
Boulder Resources/ Pascap Co., Inc.	Loose, flattened or loosely baled tin-plated steel cans	$15 - 30/gt more if baled	Bronx, NY	2 - 5 years, if baled; price tied	Broker
Ellenville Scrap Iron and Metal Company	Loose, baled, or bundled steel/tin cans	$15 (picked up) $20 - 27 (delivered)	Ulster County or Ellenville, NY	1 year	Broker/processor
Fox Run Recycling	Rinsed and baled tin-plated steel cans	$15 - 20 (picked up) $40 - 45 (delivered)	Ulster County	1 - 5 years	Processor (multi-material)
Hudson Baler	Loose tin and bi-metal cans	All: $20	Newburgh, NY	negotiable	Processor (multi-material)
Karta Container & Recovery Corp.	Loose tin-plated steel cans bi-metal beverage cans	Steel: $10 - 15/long ton Bi-metal: negotiable	Peekskill, NY	negotiable	Processor (multi-material)
Metals Unlimited	Loose metal cans	Not specified	Ulster Co.	negotiable	Processor
B. Millen Sons, Inc./ Charles Efron and Sons	Loose or baled tin-plated food cans	Baled: $20/gross ton Loose: 0 - $5 $15 delivered	Kingston, NY Ulster Co. Poughkeepsie,NY	negotiable; 6 mo. price tied to market index	Processor
Pace Glass	Loose tin and bi-metal cans	No revenue, commingled with aluminum cans (deduct wt. from alum.)	Jersey City, NJ	negotiable	Processor

* Prices listed were quoted over time period from July, 1990 to May, 1991, and may vary with market fluctuations.

Table 4-3a: UCRRA Market Survey (Major Materials)
STEEL CANS

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract Terms	Type of Market
RRT Empire Returns Corp.	Baled, flattened or densified tin cans	Baled: $44.09 Flattened: $39.09 Densified: $40.76	Pittsburgh, PA or Elizabeth, NJ Bethlehem, PA	minimum 3 years; price includes -$5.00/ton RRT commission and freight)	Processor (multi-material)
USS - Tin Mill Products	Baled or briquetted used bi-metal and steel cans	Not specified (see "Am. Metal Market"or"Iron Age")	not specified	no contract	End-User

* Prices listed were quoted over time period from July, 1990 to May, 1991, and may vary with market fluctuations.

Table 4-3b: UCRRA Market Survey (Miscellaneous Materials)
MISCELLANEOUS PAPER AND PLASTICS

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract terms	Type of Market
OTHER PAPER:					
Columbia Paper	Phone books and chip board or box board; incl. food boxes free of food, liners or plastic windows.	$0 delivered	N. Hoosick Falls, NY	n/a	End-user
Formisano Recycling	Junk mail, magazines, catalogues, phonebooks. Must be separated. Will provide gaylords.	$0 or tied to market index; delivered	Milton, NY or Newburgh, NY	not specified	Processor
Laidlaw/Canadian Pacific	Baled magazines (30% to 70% baled newspaper).	$25 picked up	Ulster County	10 years, with minimums and penalties	End-user
Marcal Paper Mills, Inc.	Loose "junk mail" and magazines, incl. glossy inserts, office paper, coupons, any envelopes, fax paper, MLS books. No newspaper, cardboard, books phone books or carbon paper.	$0 delivered or backhauled in gaylords	Elmwood Park, NJ or backhauled from Ulster County	negotiable	End-user
Red Hook Paper	Phone books, soft cover books and hard cover books minus covers. Call before delivering.	$0 delivered	Red Hook, NY	not specified	End-user
OTHER PLASTICS:					
Local packing companies: (Pack & Send, Post Express Parcel Express, Pak-Mail)	Styrene foam packing chips; also clean cardboard boxes.	n/c; delivered	Ulster Co.	n/a	Reuse
Plastics Again/Genpak	Polystyrene food service foam and expanded PS (EPS) packing material	n/c; transportation arrangements avail.	Ulster Co. sites	not specified	Processor/ end-user
Plastics Recovery Corp.	Commercial and industrial stretch wrap, plastic bags, pallet straps, pails	not specified	Ulster Co. or New Haven, CT.	1 year	Processor

* Prices listed were quoted over time period from July, 1990 to May, 1991, and may vary with market fluctuations.

Table 4-3b: UCRRA Market Survey (Miscellaneous Materials)
SCRAP METAL AND JUNK CARS

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract terms	Type of Market
Brim Recyclers	Ferrous and non-ferrous scrap metal	not specified	Cuddebackville, NY	not specified	Processor
Buck's Used Auto Parts	Used automobiles and parts	not specified	Kingston, NY	not specified	Processor
Consolidated Iron & Metal Co.	Ferrous and non-ferrous scrap metal; automobiles and parts; no tin cans.	not specified	Newburgh, NY	not specified	Processor
Chas. Effron & Sons	Will bale ferrous metal in 20 ton loads on site. No bed springs. Smaller amts. ferrous and non-ferrous delivered	-$20 to +$10; others not specified	Collected at landfill sites in Ulster Co.	1 year or more	Processor
Ellenville Scrap Iron & Metal Co.	Iron, steel, aluminum, brass, copper. Will provide roll-offs for loose scrap.	-$20 to 0 for ferrous; others not specified	Ellenville, NY or sites in Ulster Co.	1 year or more	Processor
Kingston Recycling	Junk cars and scrap metal, incl. iron, steel, alum., brass, copper, stainless.	not specified	Kingston, NY	n/a	Processor
MAC Industries	Will bale ferrous metal in 20 ton loads on site.	not specified; varies with location	Landfill sites in Ulster Co.	negotiable	Processor
Metals Unlimited	Will bale ferrous metal on site.	+$15/ton	Landfill sites in Ulster Co.	1 year or more	Processor
Mike's Scrap Metal	Non-ferrous metals (aluminum, copper, brass)	not specified	Kingston, NY	not specified	Broker
B. Millens and Sons	Will bale ferrous metal in 20 ton loads on site or accept smaller amounts delivered; also junk cars.	-$20 to +$10 ferrous; others not specified	Kingston, NY or sites in Ulster Co.	1 year or more	Processor
Northern Car Crusher	Scrap metal and junk cars	not specified	Kingston, NY	not specified	Processor
P & D Surplus	Non-ferrous scrap metal	not specified	Kingston, NY	not specified	Processor
West Shore Recycling	Ferrous scrap metal: white goods and "light iron," incl. appliances, autos and auto parts, bedsprings, baled on site in 20 ton trailer loads.	0 to +$15, depending on condition and location	Ulster Co.	not specified	Processor

* Prices listed were quoted o time period from July, 1990 to May, 1991, and may va ch market fluctuations.

Table 4-3b: UCRRA Market Survey (Miscellaneous Materials)
TIRES

Name of Market	Material Specification	Price per ton	Transportation (FOB)	Contract terms	Type of Market
Casings (permitted NYSDEC)	Auto (12-15"), light truck (16-16.5"), and large truck (20"+) tires, with or without rims; no picking.	Auto: -$.75 to -$1.25/tire lt. truck: -$1.50 to -$2.00 truck: -$5.00 - 7.50/tire trailer load: -$750 to -$1,500 (will spot trailer at n/c if filled in 4-6 weeks; doors must be kept locked at night)	Ulster Co. sites	negotiable	Broker/ Processor
Coletta Recycling (exempt from permit)	Tires up to 16" in diameter, with or without rims	-$70/ton or -$.70/tire, delivered; no charge for rims	Far Rockaway, NY (650 tires/40 yd. container)	2 years, with option	Processor
Integrated Tire (permitted NYSDEC)	Any size tire Oversize (>1124.5) Rims	Passenger and truck: -$110/ton Oversize: -$600/ton (-$.30/lb.) Rims: n/c passenger; $-10/truck (will spot trailer at n/c if filled in 30 days)	Buffalo or Port of Newark (-$1.25/round trip mile)	1 year or more; negotiable	Processor
North American Tire (permitted NYSDEC)	Passenger tires Truck tires Rims	Passenger: -$110/ton Truck: -$310/ton (-$6.50/tire) Rims: n/c (Trailer arrangements may be available.)	Rensselaer or FOB Ulster Co. for -$10/ton and -$1.75/mi.	1 year or negotiable	Processor
Oxford Tire (Connecticut Tire)	Passenger and truck tires	-$50/ton, delivered; trailer rental: -$125/mo. plus -$900/pull from Ulster Co. Rims accepted but not encouraged (-$1.00)	Plainfield, CT or Ulster Co.	negotiable	Processor
Shaker Tire/Disonell (permitted NYSDEC)	not specified	not specified	Watervliet, NY	not specified	Processor
Tire Recycling Inc. (under consent order - permit pending)	Auto and truck tires with or without rims	-$700/truckload (town loads); trailer rental -$100/mo.	Ulster Co. sites	negotiable	Processor

* Prices were quoted over time period from July, 1990 to May, 1991, and may vary with market fluctuations.

Table 4-3b: UCRRA Market Survey (Miscellaneous Materials)
BATTERIES, FREON, WASTE OIL

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract terms	Type of Market
AUTO BATTERIES:					
Revere Smelting and Refining (RSR)	Lead acid batteries	Tied to price of lead	Middletown, NY	avail. for truckload quantities	Processor
HOUSEHOLD BATTERIES:					
Mercury Refining (Batteries are sorted at Mereco's facility)	Silver oxide	2 x market price for silver ($12/lb)	Albany, NY	not specified	Processor
	Mercury oxide	$.25/lb			
	Nickel cadmium	0			
	Carbon-zinc/alkaline/zinc-air	-$.25/lb.			
	Lithium	-$6.00/lb.			
FREON:					
Especially Swedish European Auto Repair	Removes freon from refrigerators, freezers, air-conditioners and junk cars.	n/c	Saugerties, NY	Call for appt.	Collector
WASTE OIL:	(See Table 4-3 for list of local service stations and recycling centers which accept waste oil.)				
Breslube USA	Used motor oil only; no gasoline, water or other contaminants	0	collected at local sites	not specified	End-user
Environmental Recycling	Used motor oil only, no gasoline, water or other contaminants; anti-freeze	not specified	collected at local sites	not specified; 275 gallon minimum	Processor
S & M Waste Oil, Inc.	Used motor oil only; no gasoline, water or other contaminants	0 to -$.08/gal. -$25.00 charge for less than 200 gals.	collected at local sites	n/a	Processor

* Prices listed were quoted over time period from July, 1990 to May, 1991, and may v with market fluctuations.

Table 4-3b: UCRRA Market Survey (Miscellaneous Materials)
PAINT; TEXTILES; C & D / WOOD WASTE

Name of Market	Material Specifications	Price per ton *	Transportation (FOB)	Contract terms	Type of Market
PAINT:					
Dutch Boy/Sherwin Williams Paint	Water-based paint; liquid, uncoagulated; free of mercury or lead. One time pilot HHW collection sponsored by EMC.	n/c	collect at UCCC site	One-time collection	End-user (test project)
TEXTILES:					
Scott Cynamon Textiles	Hand packed shoes and handbags; used clothing and textiles; must be clean, dry and baled (>150 kg. at 20 p.s.i.); 10 ton minimum per trailer load.	negotiable	not specified	exclusivity	Broker
C & D / WOOD WASTE:					
Edgemere Development Corp.	Construction and demolition debris recycling and volume reduction facility.	fee not specified	Ulster Co.	negotiable	Processor
Forest Products N.E.	Wood wastes and construction and demolition debris processing.	percent of tipping fee and broker fee	Gloversville, NY	negotiable	Processor
Taylor Tree Service	Grinds tree stumps and wood waste	$8.00/cu. yd., del.	Montgomery, NY	negotiable	Processor

* Prices were quoted over time period from July, 1990 to May, 1991, and may vary with market fluctuations.

4.3 TRANSPORTATION AND PROCESSING

The municipalities of Ulster County spent nearly $100,000 for rental of storage equipment and transportation fees in 1990. These costs have been assumed by the UCRRA for IMA materials as the SAC System is being phased in. Future discussions will help determine which additional materials the UCRRA will assume responsibility for by providing storage equipment, transportation, processing, and marketing. Section 9.3.3 of this document describes in detail establishment of the SAC System. Section 9.3.4 of this document describes how additional materials are added to the system over time.

Material density, vehicle type and size, cost of fuel, and distance to market all influence the cost of hauling materials. The UCRRA has and will continue to factor in costs of transportation in evaluating marketing options.

Having the equipment and ability to provide some level of processing and to provide some transportation will be necessary for most IMA materials. Certain non-IMA materials, like scrap metal and waste oil, are collected on site by the markets and will not need to be centralized or processed by either the municipality or the UCRRA.

Contracts are being negotiated with Ulster County Sanitation for transportation and processing of newspaper and for the transportation of other SAC System materials. Interim arrangements have been made for the aggregation and processing of glass and tin with the Town of Ulster and for plastics and cardboard with the City of Kingston Transfer Station while SACs are being permitted and constructed in the City of Kingston and the Town of New Paltz pending ongoing negotiations.

4.4 MARKET DEVELOPMENT AND MARKET RESTRICTIONS

The UCRRA plans to work closely with the Hudson Valley Regional Council, the Ulster County Development Corporation (UCDC), and the New York State Department of Economic Development (UCDED) to encourage secondary markets to move into the County or the region to "close the loop" for recyclable materials generated by Ulster County residents, businesses, and institutions. With transportation being a major recycling cost, both economically and environmentally, closer markets will offer a definite advantage to a Countywide recycling program.

Initial meetings with representatives of the Ulster County Development Corporation, indicates that UCDC provides several services available to both commercial businesses and to municipalities that would promote secondary materials markets in Ulster County. UCDC is a private, not-for-profit corporation which, as the County's central office for economic development, administers the following programs:

a) Low interest business loans; small businesses can apply for one of five revolving loans based on location in the City of Kingston, Town of Lloyd, Village of Ellenville, Town of Wawarsing, or the remainder of Ulster County. These revolving loan funds (RLFs) can be utilized to help create jobs, to promote job retention, and to develop specific projects. The loans are available for working capital or capital expenditures (building and equipment) for up to 25-30% of total project costs, depending on location and based on job creation.

b) Ulster County Industrial Agency (UCIDA) issues Industrial Revenue Bonds (IRBs) for eligible capital expenditure projects ranging from $500,000 to $10,000,000 with interest rates at 80-90% of the prime lending rate.

c) Municipalities may be eligible for Community Development Block Grants (CDBGs) which are offered as a grant to the municipality for a specific, qualified project. These funds are loaned by the municipality to an applicant and, as the loan is repaid, a revolving loan fund is established so the funds can be "recycled" into other projects.

As a local development corporation, UCDC also serves as a conduit for New York State Job Development Authority (JDA) low interest loans for "hard assets", such as construction and equipment costs, for up to 40% of project costs on qualified projects.

The Job Training Partnership Act (JTPA) offers funding for on-the-job training and the Ulster County Chamber of Commerce offers a program whereby 50% of training costs for new employees can be reimbursed via the Targeted Job Tax Credit Program. The Small Business Development Center, Development Center for Business, and the Service Corps of Retired Executives at Ulster County Community College offer free management programs and technical assistance to small businesses. These resources will also be contracted to see if they can be of any assistance in helping businesses achieve waste reduction and adjust to mandatory recycling.

One restriction that exists through UCDC is that special incentives, such as no-interest loans or tax rebates for potential secondary markets, cannot be developed. The UCDC is able to provide the services listed above to qualified applicants, but is obligated to administer these programs as they are defined.

4.4.2 NEW YORK DEPARTMENT OF ECONOMIC DEVELOPMENT

The New York Department of Economic Development's Secondary Materials Utilization Program has several initiatives to promote secondary market development:

a) Grants for companies to evaluate specific recycling technologies and processes. Applicants must have less than 500 employees or less than $10 million gross annual sales. Grants will not exceed $100,000.

b) Financial assistance to firms for construction, alteration, repair, or improvement of buildings or equipment to utilize secondary materials. This includes loans of up to $250,000, principal reductions up to $125,000, and loan guarantees or interest subsidies of up to 75% of the prime lending rate.

The UCRRA had expressed interest in participating in the DED's Regional Marketing Cooperative grant to form a multi-county marketing cooperative patterned after the New Hampshire regional marketing cooperative. An application by Putnam and Orange Counties, proposed to include Ulster County, was made in May, 1989. The Board of the UCRRA expressed interest in the concept of a cooperative regional marketing effort, but felt that the UCRRA's participation at that time was premature. The UCRRA was in the process of developing its recycling program and conducting its own market search. This grant was awarded, but all three Counties involved agreed that it was important to finish implementing their own initial programs before attempting cooperative efforts. The grant was withdrawn by the DED in December, 1989. The potential benefits of regional cooperation for increased strength in the marketplace are well appreciated and will be explored further in the future.

The DED's Office of Recycling Market Development also publishes Technical Assistance Bulletins (#1 on Waste Tire Consumers in the Northeastern United States and #2 1989 Status of the Markets for Paper, Glass, Metal, and Plastics, and The Market, a monthly report on recycling markets in and around New York). These publications, as well as ongoing communications, and technical assistance provided by the DED, have been invaluable resources.

Finally, for mandatory recycling to be effective, the UCRRA should be able to serve as the "market of last resort", a policy developed by the State of Rhode Island, prior to implementing the very effective statewide mandatory recycling program. (The State of Rhode Island is approximately the same size as Ulster County.) This will allow businesses to continue to market materials directly, if it is cost-effective, but will provide an alternative for businesses not electing to market their materials directly. This approach will at least interfere with the existing market structure for secondary materials.

4.4.3 NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA)

The Town of Gardiner has been working with New York State Energy Research and Development Authority (NYSERDA) to develop a grant for a proposed research project to determine the potential for using land storage technologies to handle certain recyclables in times of market saturation, or to increase a municipality's ability to be speculative in the marketplace. The UCRRA is on the advisory committee for this project and will review it for consistency with the Ulster County Solid Waste Management Plan. NYSERDA is also offering a grant for waste reduction.

4.4.4 MARKET RESTRICTIONS

The most important component needed for efficient marketing is processing capability which underscores the importance of constructing and equipping the proposed processing centers or SACs. This will allow the UCRRA to utilize end-markets, both foreign and domestic, and maximize revenues.

Tire recycling will remain a problem until markets are expanded by using rubberized asphalt on roadways. This major secondary use for waste tires will stimulate secondary markets. Once this happens, a concerned effort will be made to expand the tire processing facilities in this area.

The cardboard industry has not yet expanded its long-term capacity and may experience the same problem of increase supply, such as newspaper did, once mandatory commercial, institutional, and industrial legislation goes into effect. Revenues have already decreased. The DED is aware of this problem and is already working to stimulate increased capacity for New York's corrugated cardboard.

Plastics recycling is predicted to expand greatly over the next few years. One research firm expects demand for United States recyclables to increase 44% (1.15 million tons) each year through 1994. [Recycling Today, February, 1991, page 38.] In the meantime, solving collection, sorting, and densification problems will be essential.

Another concern in plastics recycling is the question of residual toxic products, cleaning products, and beauty salon products. Since these businesses are mandated to participate in recycling, the minimal amounts of hazardous residual materials now received by markets may exceed the threshold acceptable for secondary processing. This bears further consideration.

5.0 SOLID WASTE DISPOSAL TECHNOLOGY EVALUATION

5.0 SOLID WASTE DISPOSAL TECHNOLOGY EVALUATION

5.1 INTRODUCTION

5.1.1 BACKGROUND

A key element in the development of the comprehensive solid waste management plan for the County is the identification of appropriate technologies for the processing and disposal of solid waste. It is important to recognize that regardless of the technology or group of technologies recommended in this evaluation, that some portion of the solid waste stream will require landfilling. The role that recycling plays in the management of the County's solid waste will also have a significant impact on the implementation approach identified by the UCRRA.

UCRRA recognizes that recycling is an important part of the overall plan for proper solid waste management. Implementation of the recycling program (outlined in Chapter 9.0 of this document) will provide the benefits of dramatically reducing the solid waste stream quantity and conserving some of the town's remaining landfill capacity.

In addition to implementing a recycling plan, it is necessary to investigate and evaluate solid waste disposal technologies for that portion of the County solid waste stream that may not be recycled. Accordingly, this chapter presents an evaluation of solid waste disposal technologies.

5.1.2 SOLID WASTE DISPOSAL TECHNOLOGY EVALUATION DEVELOPMENT (SWDTE)

The development of a solid waste disposal technology evaluation for that portion of the County solid waste stream that may not be recycled is a complex task including, but not limited to:

- Defining the purpose, scope, and objectives of the evaluation;
- Obtaining accurate background information about existing solid waste stream characteristics;
- Predicting the impact of recycling on the solid waste stream and estimating the resultant solid waste stream characteristics after recycling;

- Identifying the known solid waste disposal technologies and determining their applicability to the resultant solid waste stream;

- Developing the overall framework to evaluate solid waste disposal technologies;

- Creating generic evaluation parameters and minimum acceptable criteria to compare and rank the solid waste disposal technologies; and

- Recommending the preferred solid waste disposal technologies based upon the evaluation findings and conclusions.

This chapter addresses these items. It should be noted that to develop this technology evaluation, it was necessary to make certain assumptions and estimates as well as to use information and data compiled in other sections of the DGEIS. For more details and background data on the technology assessment, the reader is referred to:

a) DGEIS, Section 5.0, Solid Waste Disposal Technology Evaluation;
b) DGEIS, Appendix H, Technology Evaluation Phased Analysis;
c) DGEIS, Appendix I, Energy Markets;
d) Response Document, Section 3.0 and 5.0;
e) Supplemental DGEIS, Section 4.0, Review of Existing Landfills;
f) Supplemental DGEIS, Section 5.0, Landfill Reclamation
g) Supplemental Response Document, Sections 3.0, 4.0, & 5.0
h) Findings Statement, Section 3.0, Establishing a Countywide Solid Waste Management Strategy Using Aggressive Reduction, Reuse, and Recycling Program and Landfill Disposal Technology

5.1.3 PURPOSE, SCOPE, AND OBJECTIVES

The SWDTE is a comprehensive comparison of various technologies to determine their applicability to the resultant County solid waste stream after recycling. The primary purpose of this evaluation was to assist the UCRRA in fulfilling its responsibility to develop a long term solid waste management plan for Ulster County.

The scope of such an evaluation is dependant upon a number of factors, such as the identification of the existing County solid waste stream (including composition and quantity) and projections for the future.

Another key factor is the anticipated impact recycling will have on the solid waste stream. Based upon the predicted impact of the recycling program, an estimate of the remaining solid waste stream was made. This forms the basis for the solid waste disposal technology evaluation. Additionally, the applicability of various technologies to the resultant solid waste stream was analyzed.

As part of the evaluation process, evaluation parameters and minimum acceptable criteria were established for technical, environmental, economic, and siting considerations. Each solid waste disposal technology was evaluated and ranked using these evaluation parameters and criteria. The final step in the overall scope of the SWDTE was to identify the preferred technology(ies) to be used in the County solid waste management plan.

Although the basic objective of this technology evaluation was to assist the UCRRA in the development of a long term solid waste management plan, there were other significant objectives. One objective was to ensure that the evaluation was responsive to the "solid waste management method hierarchy" as described in the Solid Waste Management Act of 1988 and by the NYSDEC in the State Plan. This hierarchy establishes the following order of preference:

- Waste reduction
- Recycling and reuse
- Waste-to-energy
- Landfilling

The NYSDEC has indicated to the UCRRA that following this hierarchy is not a regulatory requirement. However, any modifications to the order of the hierarchy (ie. choosing not to develop a waste-to-energy facility) would require justification.

A final objective of the SWDTE was to augment the projected recycling programs with technologies that can provide reliable, environmentally acceptable, and economically feasible solid waste disposal solutions for that portion of the County solid waste stream that may not be recyclable. The identification and use of a preferred technology that is compatible with recycling would create a genuinely integrated long term solid waste management plan.

5.1.4 DEFINITION OF THE RESULTANT SOLID WASTE STREAM

A complete discussion of the solid waste stream analysis is provided in Chapter 3.0 of this document. This subsection summarizes the resultant solid waste stream after reuse and recycling percentages are applied.

The 1988 overall County solid waste generation rate (excluding sewage sludge) was approximately 610 tpd. In 1988, recycling and reuse diverted 8% by weight or approximately 49 tpd from the 610 tpd, thereby leaving approximately 561 tpd as the resultant solid waste stream requiring disposal.

For the purposes of conducting the solid waste disposal technology evaluation, the following assumptions were used:

- The technology evaluation used the projected total County solid waste generation rate at the midpoint of the 1994-2014 planning period. Therefore the overall solid waste stream, including sewage sludge, in the year 2004 is expected to be 825 tpd. See Table 3-12 and DGEIS, Section 4.0;

- As described in Chapter 9.0 of this document and the DGEIS, Volume IV (RAP), recycling, reuse, and waste reduction in 2004 is targeted to reach 50 percent by weight of the total solid waste stream or approximately 400 tpd;

- To develop the estimated processing capacities for the technologies under consideration, the size of the resultant solid waste stream is based upon projected waste quantities at the midpoint of the planning period (the year 2004). The basis of selecting the midpoint is that it represents a balanced planning approach since it provided for flexibility in addressing variations in waste quantities that may result from shifts in population, waste reduction measures, and recycling activities; and

- The resultant solid waste stream in the year 2004 is approximately 400 tpd. However, for the purpose of sizing disposal facilities, it is assumed that 40% percent of the waste stream would either be recycled and/or reused. This provides for conservatism in planning. In developing the capacity or size of the landfill, it was assumed that approximately 500 tpd would be received, while waste-to-energy would incorporate an availability factor of 80 - 85%

(to address scheduled and unscheduled downtime) thereby resulting in a design or "nameplate" capacity of approximately 600 tpd, which is equivalent to average processing or "throughout" capacity of approximately 500 tpd.

Table 5-1 defines the list of the solid waste components comprising the resultant solid waste stream and their typical characteristic generation rates in the year 2004 using the facility sizing assumption of 40% waste reduction and recycling. Figure 5-1 displays the projected impact of recycling in the year 2004 on defining the resultant solid waste stream.

TABLE 5-1

PROJECTED RESULTANT SOLID WASTE STREAM FOR YEAR 2004
USED IN TECHNOLOGY/ECONOMIC EVALUATION
(10% WASTE REDUCTION/30% RECYCLING)[1]

Solid Waste Stream Component	Overall Characteristic Component Generation Rate and Percent of Total	Waste Reduction, Recycling, and Reuse Impact	Resultant Component Generation Rate
Residential, Commercial, and Non-Hazardous Industrial	574 tpd (70%)	204 tpd	370 tpd
Construction & Demolition	70 tpd (8%)	7 tpd	63 tpd
Leaf & Yard	76 tpd (9%)	26 tpd	50 tpd
Tires	6 tpd ((1%)	3 tpd	3 tpd
Sewage Treatment Plant Sludge	51 tpd (6%)	51 tpd	0 tpd
Water Treatment Plant Sludge	4 tpd ((1%)	0 tpd	4 tpd
Waste Oil	8 tpd (1%)	5 tpd	3 tpd
Apple Pomace	30 tpd (4%)	30 tpd	0 tpd
Grape Pomace	2 tpd ((1%)	2 tpd	0 tpd
Offal	4 tpd ((1%)	4 tpd	0 tpd
TOTALS	825 tpd (100%)	332 tpd	493 tpd

Notes: (1) Based upon 365 days per year

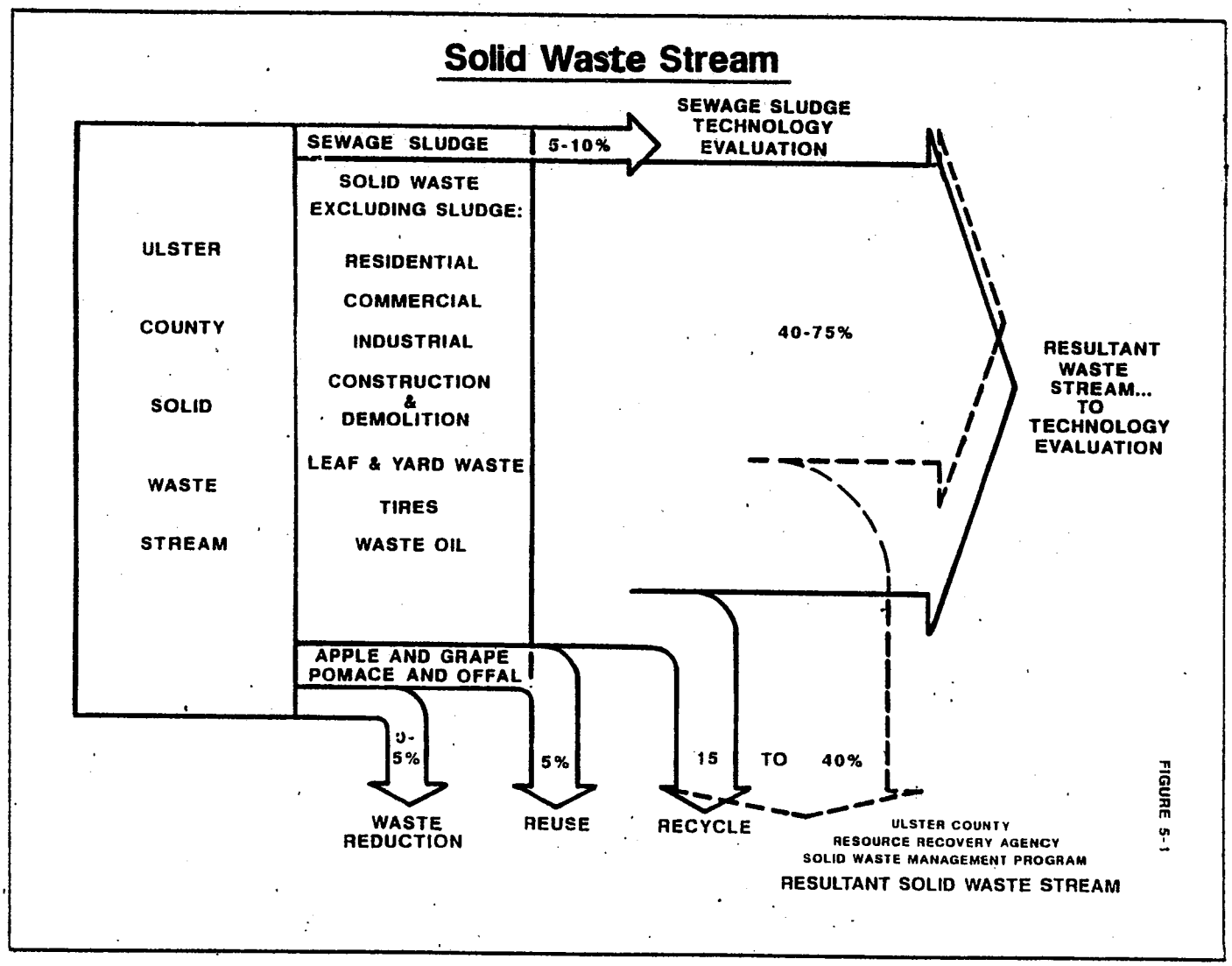
5.2 IDENTIFICATION OF SOLID WASTE DISPOSAL TECHNOLOGIES

5.2.1 DESCRIPTION OF THE TECHNOLOGY CATEGORIES

This sub-section identifies and briefly describes solid waste disposal technologies that are considered in this technology evaluation. Historically, solid waste disposal technologies have been grouped into separate categories for ease of comparison. The following five

categories of solid waste disposal technologies were evaluated (A brief description of each follows):

- **Material recovery systems**
- **Biology recovery systems**
- **Thermal recovery systems**
- **Landfills**
- **Exportation to landfills**



- **Material Recovery Systems** - Material recovery systems represent a group of technologies that employ mechanical equipment to physically sort recoverable material from the resultant mixed solid waste stream. The remaining solid waste, ideally devoid of recyclable materials such as glass and aluminum and reduced in overall volume, can be used as a feedstock for a biological system, as fuel for a thermal system, or simply landfilled. It should be

noted that although the objectives of recycling and reuse in comparison to the objectives of material recovery systems are identical (ie. recovery of materials from the waste stream), for the purposes of this technology evaluation it is assumed that recycling and reuse is performed on unmixed solid waste at its origination point, whereas the mixed solid waste stream is used for material recovery systems.

- **Biological Recovery Systems** - Biological recovery systems generally involve the breakdown of mechanically processed solid waste to produce recyclable organic material such as compost and also fuel which can be utilized for energy. To be effective, this category of technologies typically requires mechanical processing similar to that of material recovery systems.

- **Thermal Recovery Systems** - Thermal recovery systems include a group of combustion and degradation methods where the organic portion of the resultant solid waste stream is combusted or thermally reduced to create energy. Combustion of solid waste can result in significant volume reduction of the solid waste stream. In addition, the heat energy can be put to use for the creation of steam, hot water, and/or electric power.

- **Landfills** - Landfilling of solid waste makes use of available land area for disposal of the total raw solid waste stream or non-reclaimed portions therein. Once the appropriate site development work (e.g., installation of liners, leachate collection systems, etc.) has been completed, the solid waste is then spread, compacted, and covered with clean soil in successive layers. Landfilling may be used for the entire resultant solid waste stream or any percentage thereof if another technology is first used to extract or reduce some portion of the solid waste. It should be noted that in developing a landfill facility, different types of wastes (such as construction and demolition debris) may involve different types of site development (i.e., the number and types of liners). Accordingly, in developing a landfill, it may be appropriate to provide for differing levels of site development to address the different types of wastes.

- **Exportation to Landfills** - The transportation of the resultant solid waste stream to an outside entity such as another County or State will also be discussed as part of the technology evaluation.

5.2.2 SUMMARY

The overview presented above provides a basic understanding of each category of waste disposal technology. Within each category, there may be several variations which represent individual types of technologies. Individual technologies for each category are shown in Table 5-2. These technologies have been evaluated for applicability to the resultant County solid waste stream. A detailed description of each individual technology is provided in Appendix H of the DGEIS.

It should be noted that the UCRRA has received a number of unsolicited vendor letters of interest and technical specification for various individual technologies. In addition, the UCRRA hosted several presentations from interested vendors. Table 5-3 summarizes much of the information provided by vendors to the UCRRA as of November 1, 1988. Information obtained from vendors during these presentations as well as the unsolicited information provided by vendors has been used as reference material during the solid waste disposal technology evaluation.

5.2.3 TECHNOLOGY EVALUATION FRAMEWORK

Because of the complexity associated with evaluating the individual technologies identified in Table 5-2, a technology evaluating methodology was established. To conduct the analysis of the alternative technologies, the following four factors were considered: technical, environmental, economic, and siting. The evaluation occurred in four phases as illustrated in the following outline.

Phase	Evaluates	For These Factors	and Identifies
1.	Solid Waste Technologies	Technical	Candidate Technologies
2.	Candidate Technologies	Technical, Environmental, Siting	Acceptable Technologies
3.	Acceptable Technologies	Technical, Economic, Environmental	Preferred Technologies
4.	Preferred Technologies	Economic	Recommended Technologies

Figure 5-2 provides a schematic illustration of how the four phase evaluation framework is to be used. The following sub-sections describe the technology evaluation and the identification of the recommended technologies for the County.

TABLE 5-2
INDIVIDUAL SOLID WASTE DISPOSAL
TECHNOLOGIES WITHIN EACH TECHNOLOGY CATEGORY

Technology Category	Individual Technologies
Material Recovery Systems	Material Recovery Material Recovery and Refuse Derived Fuel (RDF) Production Material Recovery, RDF Production and Composting
Biological Recovery Systems	Composting Anaerobic Digestion Enzyme Hydrolysis
Thermal Recovery Systems	Waste-to-Energy (WTE) - Mass Combustion Field-erected - Mass Combustion Field-erected with Preprocessing - Mass Combustion Modular - Mass Combustion Modular with Preprocessing RDF-to-Energy - Spreader Stoker Combustion - Suspension Combustion - Fluidized Bed Combustion Pyrolysis
Landfills	Expansion of Existing Capacity New Capacity

5.3 PHASE 1 - IDENTIFICATION OF CANDIDATE TECHNOLOGIES

5.3.1 EVALUATION PARAMETERS AND CRITERIA

The purpose of Phase 1 was to evaluate fundamental technical factors for the solid waste disposal technologies and subsequently identify a list of candidate technologies for further evaluation in Phase 2. Three fundamental technical factors were evaluated in this phase:

- Commercial availability
- Successful United States operational history
- Compatibility with recycling

TABLE 5-3

REPRESENTATIVE SUMMARY OF UNSOLICITED EXPRESSIONS OF INTEREST(1)

Technology Category	Vendor Name and Location	Comments
Material Recovery Systems	Reuter Resource Recovery/Buhler-Miag Hopkins, MN	Material Recovery, RDF Production and Composting
Biological Recovery Systems	Enviro-Gro Tech./Ebara Baltimore, MD	Composting and Material Recovery
	Environmental Recovery Systems, Denver, CO	Composting and Material Recovery
	Waste to Plant Food Corp. Santurce, PR	Composting and Material Recovery
Thermal Recovery Systems	American Ref-fuel Houston, TX	Waste-to-Energy
	Combustion Engineering Windsor, CT	RDF-to-Energy
	Foster Wheeler Co. Perryville, NJ	Waste-to-Energy
	Harbert/Triga Co. Birmingham, AL	Waste-to-Energy
	LaBov Associates Bala Cynwyd, PA	Waste-to-Energy
	Ogden Martin Co. Fairfield, NJ	Waste-to-Energy
	UEC Energy Management Pittsburgh, PA	Waste-to-Energy
	Westinghouse Co. Pittsburgh, PA	Waste-to-Energy
Landfills	Browning-Ferris Ind. Houston, TX	New landfills
Exportation to Landfills	Solid Waste Industries Binghamton, NY	Out of County Landfill

Note: (1) The information provided in this table is intended to be representative of vendors contacting the UCRRA. It may not include every unsolicited expression of interest received by the UCRRA.

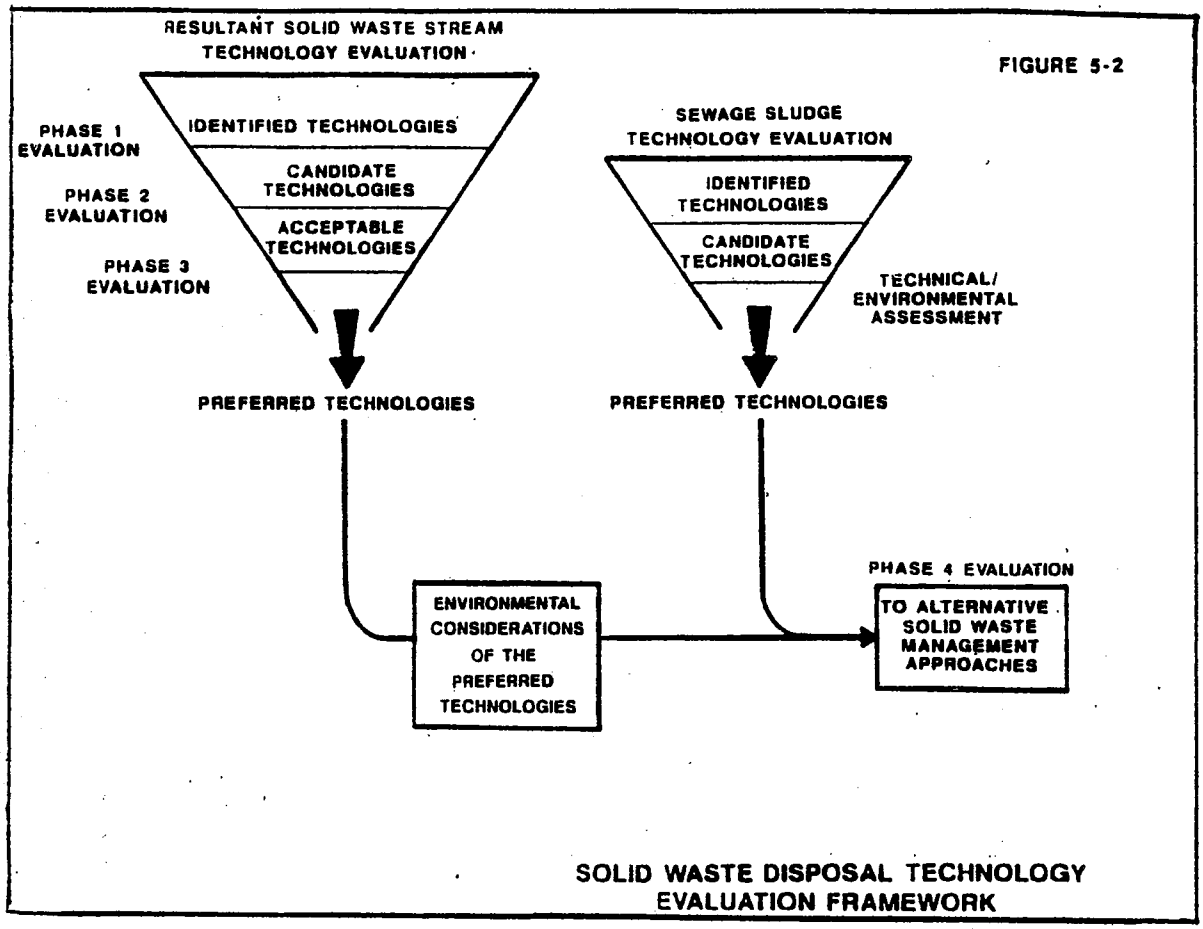


FIGURE 5-2

SOLID WASTE DISPOSAL TECHNOLOGY
EVALUATION FRAMEWORK

Table 5-4 presents the three technical factors and the parameters and criteria used to evaluate them.

TABLE 5-4

PHASE 1: IDENTIFICATION OF CANDIDATE TECHNOLOGIES
EVALUATION PARAMETERS AND CRITERIA

Evaluation Parameter	Criteria
Technical Factors:	
Is the technology commercially available?	Must be at least one domestic or one foreign vendor that markets the technology with a unit or facility size equal to or greater than 50 percent of the capacity anticipated for the County.
Has the technology demonstrated successful operational history?	Must be at least one U.S. example of a the technology in current operation with at least a three year successful operating history and having a facility size equal to or greater than 50 percent of the capacity anticipated for the County.
What is the compatability of technology with recycling?	The technology must be flexible to the allow for the implementation of an aggressive recycling program.

5.3.2 RANKING PROCEDURE

The ranking procedure used in Phase 1 is a simple numerical point award system. Specifically, one point was awarded to a solid waste disposal technology if it satisfied the criteria for an evaluation parameter. Since there are three evaluation parameters, the maximum award possible for each individual technology was three points.

The establishment of a ranking cut-off point was predicated upon the requirement that only those commercially available technologies with a sufficient successful U.S. operating history in a size range appropriate for the County be considered for further investigation, provided that those technologies are compatible with recycling. Therefore, Phase 1 was exclusionary in scope. A solid waste disposal technology that did not satisfy all three of the candidate technology criteria was excluded from further consideration.

5.3.3 IDENTIFICATION OF CANDIDATE TECHNOLOGIES

A summary of the Phase 1 technology evaluation is provided in Table 5-5. This evaluation resulted in identifying ten out of eighteen individual technologies as suitable for the County resultant solid waste stream. Each of these ten satisfied the criteria for all three evaluation parameters. Table 5-6 lists the ten candidate technologies.

The eight excluded technologies did not demonstrate either commercial availability, successful operational history, or compatibility with recycling. It was recommended that the County not consider these for use in disposing of the resultant solid waste stream. Substantial technical, environmental, and economic risks are associated with developmental or unproven technologies. It was further recommended that once the County has identified its preferred technologies for disposal of the resultant solid waste stream, it may be appropriate to consider a demonstration project which would involve the use of one or more of the excluded technologies.

PHASE ONE RANKING RESULTS OF THE
SOLID WASTE DISPOSAL TECHNOLOGIES

Technology Category	Individual Technologies	Phase 1 Total Score	Status
Material Recovery Systems	Material Recovery	1	Excluded
	Material Recovery and RDF Production	3	Candidate
	Material Recovery, RDF Production, and Composting	3	Candidate
Biological Recovery Systems	Composting	2	Excluded
	Anaerobic Digestion	2	Excluded
	Enzyme Hydrolysis	2	Excluded
Thermal Recovery Systems	Waste-to-Energy		
	- Mass Combustion Field-erected	3	Candidate
	- Mass Combustion Field-erected with Preprocessing	3	Candidate
	- Mass Combustion Modular	3	Candidate
	- Mass Combustion Modular with Preprocessing	3	Candidate
	RDF-to-Energy		
	- Spreader Stoker Combustion	3	Candidate
	- Suspension Combustion	N.R.	Incorporated into the material recovery and RDF production evaluation
	- Fluidized bed combustion	3	Candidate
	Pyrolysis	2	Excluded
Landfills	Expansion of Existing Capacity	2	Excluded
	New Capacity	3	Candidate
Exportation to Landfills	In State	2	Excluded
	Out of State	3	Candidate

N.R. = Not Rated

TABLE 5-6

CANDIDATE SOLID WASTE DISPOSAL
TECHNOLOGIES WITHIN EACH TECHNOLOGY CATEGORY

Technology Category	Individual Technologies
Material Recovery Systems	- Material Recovery and RDF Production - Material Recovery, RDF Production, and Composting
Thermal Recovery Systems	Waste-to-energy - Mass Combustion Field-erected - Mass Combustion Field-erected with Preprocessing - Mass Combustion Modular - Mass Combustion Modular with Pre-Processing RDF-to-energy - Spreader Stoker Combustion - Fluidized Bed Combustion
Landfills	New Capacity
Exportation to Landfills	Out of State

5.4 PHASE 2 - IDENTIFICATION OF ACCEPTABLE TECHNOLOGIES

5.4.1 EVALUATION PARAMETERS AND CRITERIA

The purpose of Phase 2 of the evaluation was to further assess the candidate technologies that were identified in Phase 1 and to identify acceptable technologies which would be further evaluated in Phase 3.

Ten technical, environmental, and siting factors were considered in this phase:

Technical Factors

- Reliability
- Implementation time

Environmental Factors

- Air quality impacts
- Ground and surface water impacts
- Odors and vectors
- Landfill requirements

Siting Factors

- Noise level
- Traffic volume
- Land use compatibility
- Aesthetics

Each of the ten factors were converted into evaluation parameters for consideration in this phase. Table 5-7 presents the evaluation parameters and criteria used for evaluating the candidate technologies in Phase 2.

5.4.2 RANKING PROCEDURE

The ranking procedure used in Phase 2 was a weighted point award system and was used to identify acceptable technologies for the County. The following ranking procedure was applied to each of the ten evaluation parameters:

- Technology has the potential to satisfy the evaluation criteria = 0.5 point
- Technology has demonstrated the inability to satisfy the evaluation criteria = 0 point
- The three evaluation categories were weighted as follows:

Technical	= 20
Environmental	= 40
Siting	= 40
Total	= 100

Each of the three evaluation categories subtotal point awards for all the candidate technologies were multiplied by the above weights to yield an overall score. The maximum score possible for a candidate technology in this phase was 400 and the minimum score was zero. It was anticipated that the majority of candidate technologies would cluster around a certain range of scores. Candidate technologies in or above this range of scores were identified as acceptable technologies and are further evaluated in Phase 3. Candidate technologies which fell below the cluster range of scores were excluded from further evaluation.

5.4.3 EVALUATION OF THE CANDIDATE SOLID WASTE DISPOSAL TECHNOLOGIES

Details of the evaluation of the candidate technologies under Phase 2 is presented in Appendix H of the DGEIS. An evaluation score summary for this phase of the technology evaluation is provided in Table 5-8. The next section, 5.4.4, describes the identification of the acceptable technologies.

5.4.4 IDENTIFICATION OF ACCEPTABLE TECHNOLOGIES

Table 5-8 depicts the Phase 2 "Evaluation Score Summary" of the candidate technologies. Based on this assessment, a determination was made regarding which candidate technologies were considered acceptable for the County. The distribution of Phase 2 evaluation scores from highest to lowest was as follows:

Candidate Technology	Phase 2 Evaluation Score
Mass Combustion Field-Erected	290
Mass Combustion Field-Erected w/Preprocessing	290
Mass Combustion Modular	280
Mass Combustion Modular w/Preprocessing	280
Spreader Stoker Combustion	260
Landfill	260
Exportation to landfill	240
Fluidized Bed Combustion	230
Material Recovery and RDF Production	210
Material Recovery, RDF Production & Composting	210

Note that there appears to be two general clusters of scores (260-290 and 210-240). The high range cluster scores indicate acceptable technologies for the County while the low range cluster of scores indicate unacceptable technologies.

TABLE 5-7

PHASE 2: IDENTIFICATION OF ACCEPTABLE TECHNOLOGIES
EVALUATION PARAMETERS AND CRITERIA

Evaluation Parameter	Criteria
Technical Factors	
What is the reliability of the technology for solid waste disposal?	The technology should have demonstrated through operating experience that it can consistently operate at design capacity 80 percent or more of the time.
What is the expected implementation time required for the technology?	The technology should have demonstrated that it can be implemented at the capacity necessary for the County in a timely and expeditious manner. Specifically, the time required for vendor procurement, permitting, design and construction should be considered.
Environmental Factors	
How will air quality be if the technology used?	The technology should have protected demonstrated through operating is experience that it can meet state and federal air quality standards.
How will surface and ground water be protected if the technology is used?	The technology must have demonstrated through operating experience that it can meet state and federal applicable regulations for surface and ground water.
Will the technology be able prevent or minimize odors vectors?	The technology should have a to demonstrated history of odor and mitigation and control of vectors.
Will the technology require disposal of raw solid waste or portions therein by a sanitary waste landfill as a result of the technology either not accepting certain portions of the waste or having an operating history that indicates waste bypasses the facility as a result of downtime?	The technology should have a demonstrated history of minimizing the solid waste that bypasses the facility for landfill or requires direct landfilling due to technology limitations.
Siting Factors	
What is the noise level of the technology?	The technology should have demonstrated that noise associated with it can be controlled and/or mitigated to levels that are acceptable to regulatory requirements.
What level of vehicular traffic is associated with the technology?	In comparison to the other technologies, what is the expected level of traffic volume.
Is the technology compatible with existing land uses?	The technology should be compatible with existing land uses.
How will the technology affect the visual aspects of the site?	Existing facilities utilizing the technology should have demonstrated the ability to mitigate the visual impacts of the facilities.

TABLE 5-8

CANDIDATE TECHNOLOGIES

PHASE 2 EVALUATION SCORE SUMMARY

Evaluation Parameters	Material Recovery Systems: Material Recovery and RDF Production	Material Recovery Systems: Material Recovery, RDF Prod. and Composting	Waste-to-Energy: Mass Combustion, Field-Erected	Waste-to-Energy: Mass Combustion Field-Erected With Preprocessing	Waste-to-Energy: Mass Combustion Modular	Waste-to-Energy: Mass Combustion Modular With Preprocessing	RDF-to-Energy: Spreader Stoker Combustion	RDF-to-Energy: Fluidized Bed Combustion	New Landfill Capacity	Exportation To Landfills
Technical Factors (20)										
Reliability	0	0	1	1	0.5	0.5	0.5	0	1	0
Implementation Time	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0
	0.5x20=10	0.5x20=10	1.5x20=30	1.5x20=30	1x20=20	1x20=20	1x20=20	0.5x20=10	2x20=40	0x20=0
Environmental Factors (40)										
Air Quality Impacts	1	1	1	1	1	1	1	1	1	1
Ground and Surface Water Impacts	1	1	1	1	1	1	1	1	1	1
Odors and Vectors	0.5	0.5	1	1	1	1	1	1	0.5	1
Landfill Requirements	0	0	1	1	1	1	0.5	0	0	0.5
	2.5x40=100	2.5x40=100	4x40=160	4x40=160	4x40=160	4x40=160	3.5x40=140	3x40=120	2.5x40=100	3.5x40=140
Siting Factors (40)										
Noise Levels	1	1	1	1	1	1	1	1	1	0.5
Traffic Volume	0	0	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5
Land Use Compatability	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Aesthetics	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1
	2.5x40=100	2.5x40=100	2.5x40=100	2.5x40=100	2.5x40=100	2.5x40=100	2.5x40=100	2.5x40=100	3x40=120	2.5x40=100
TOTALS	210	210	290	290	280	280	260	230	260	240

Candidate technologies that scored in the high range (260-290) in general demonstrated the ability to satisfy or have the potential to satisfy the criteria for the technical, environmental, and siting factors considered in Phase 2. For example, some of the factors contributing to the lower scorings in this cluster were:

- Exportation to Landfill:
  - Reliability
  - Implementation Time
- Fluidized Bed Combustion:
  - Reliability
  - Landfill Requirements
- Material Recovery and RDF Production:
  - Reliability
  - Odors and Vectors
  - Landfill Requirements
  - Traffic Volume
- Material Recovery, RDF Production, and Composting:
  - Reliability
  - Odors and Vectors
  - Landfill Requirements
  - Traffic Volume

Since these four candidate technologies (in the 210-240 range) did not show a demonstrated ability to sufficiently address such important factors as reliability, reducing landfill requirements, odors and vectors, and traffic volume, it was recommended that the County not consider them for use in disposing of the resultant solid waste stream. It was further recommended that once the County identified a combination of preferred technologies, it may be appropriate to consider undertaking a demonstration project involving one or more of the excluded technologies.

5.5 PHASE 3: IDENTIFICATION OF PREFERRED TECHNOLOGIES

5.5.1 EVALUATION FACTORS

The purpose of Phase 3 was to further evaluate the acceptable technologies and thereby identify preferred technologies for the County. In this phase, technical, environmental, and economic factors were considered.

Technical Factors

- Flexibility
- Redundancy
- Design complexity
- Operational complexity
- Safety record
- Warranties/guarantees
- Land Area Requirements

Economic Factors

- Material recovery revenue
- Energy recovery revenue
- Capital cost
- Operation & maintenance cost
- Net cost per ton of solid waste
- Financing

Environmental Factors

- Number and complexity of permits
- Regulatory agency support

Specifically, the detailed information regarding the acceptable technologies considered in Phase 3 focused on technical factors (design, construction, and operation), economic factors (cost, revenues, and financing) and environmental factors (permits and regulatory scrutiny).

Due to the detailed level of evaluation, it was appropriate to conduct a relative comparison between the acceptable technologies. Therefore, the approach of utilizing minimum acceptable criteria for the evaluation factors was not used. Instead the factors were considered as preferential and as such the evaluation resulted in a comparison of acceptable technologies.

5.5.2 RANKING PROCEDURE

The ranking procedure used in Phase 3 involved a more in-depth review of the acceptable technologies. Each acceptable technology was assigned a relative ranking for each evaluation factor. The results were summarized in an evaluation matrix. This ranking system was structured to compare the relative advantages and disadvantages of the acceptable technologies under consideration. Any potential beneficial impacts or adverse impacts were noted. The rankings used were as follows:

- Technology Favorable (TF): Most advantageous or least adverse impact.

- Technology Acceptable (TA): Potential concerns reasonably addressed.

- Technologically Acceptable with Qualification (TAQ): Potentially satisfactory impact/effect provided that certain concerns were addressed.

- Technologically Marginal (TM): Questionable impact/effect even with mitigative or corrective measures.

- Technologically Unfavorable (TU): Potential for severe negative impact or unable to meet minimum acceptable criteria.

- Not Applicable (NA): Impact/effect was not applicable.

Rankings were tabulated using the abbreviations in parentheses. Only those acceptable technologies that consistently ranked high in the evaluation factor matrix were classified as preferred technologies.

5.5.3 EVALUATION OF THE ACCEPTABLE SOLID WASTE DISPOSAL TECHNOLOGIES

The Phase 3 evaluation considered the performance of individual, acceptable technologies identified in Phase 2. Appendix H of the DGEIS presents this evaluation process in detail. A ranking summary for Phase 3 is provided in Tables 5-9 and 5-10.

5.5.4 IDENTIFICATION OF PREFERRED TECHNOLOGIES

Based on the ranking summaries found in Tables 5-9 and 5-10, it was determined which acceptable technologies should be considered preferred technologies. Generally, if a technology scored either a TF (technical favorable), TA (technologically acceptable), or a TAQ (technologically acceptable with qualification) this indicated that potential problems with these items could be mitigated or eliminated by available means.

Table 5-9 also indicates that there are certain acceptable technologies that differ significantly from

TABLE 5-9

SIDE-BY-SIDE PHASE THREE RANKING RESULTS OF THE SOLID WASTE DISPOSAL TECHNOLOGIES

	Waste-to-Energy				RDF-to-Energy	Landfill
Factor	Mass Combustion Field-Erected	Mass Combustion Field-Erected with Preprocessing	Mass Combustion Modular	Mass Combustion Modular with Preprocessing	Spreader Stoker Combustion	
Technical Considerations						
- Flexibility	IA	IA	IA	IA	IAQ	IF
- Redundancy	IF	IF	IAQ	IA	IH	IF
- Design Complexity	IA	IAQ	IA	IAQ	IAQ	IA
- Operational Complexity	IA	IAQ	IAQ	IH	IAQ	IA
- Safety	IA	IH	IA	IH	IH	IA
- Warrantees/Guarantees	IA	IAQ	IH	IU	IA	IF
- Land Area Requirements	IF	IF	IF	IF	IF	IU
Economic Considerations						
- Material Recovery Revenue	IH	IAQ	IH	IAQ	IH	IH
- Energy Recovery Revenue	IA	IA	IH	IH	IA	NA
- Capital Cost	IA	IH	IA	IH	IA	IA
- Operation and Maintenance Cost	IA	IAQ	IH	IH	IAQ	IA
- Net Cost for Disposal	IA	IAQ	IAQ	IH	IAQ	IA
- Financing	IA	IA	IAQ	IAQ	IA	IA
Environmental Considerations						
- Number and Complexity of Permits	IA	IA	IAQ	IAQ	IA	IF
- Regulatory Posture	IA	IF	IAQ	IAQ	IA	IH

TABLE 5-10

PHASE THREE RANKING RESULTS SUMMARY OF THE SOLID WASTE DISPOSAL TECHNOLOGIES

Technology	Ranking Results					
	Technically Favorable (TF)	Technically Acceptable (TA)	Technically Acceptable with Qualification (TAQ)	Technically Marginal (TM)	Technically Unfavorable (TU)	Not Applicable (NA)
Mass combustion field-erected	2	12	0	1	0	0
Mass combustion field-erected with preprocessing	3	5	5	2	0	0
Mass combustion modular	1	4	6	4	0	0
Mass combustion modular with preprocessing	1	2	5	6	1	0
Spreader stoker Combustion	1	6	5	3	0	0
Landfill	4	7	0	2	1	1

each other for certain evaluation factors. Table 5-11 identifies the technologies which received technologically marginal (TM) or technologically unfavorable (TU) ratings. A brief summary of the evaluation of each technology follows:

- **Mass Combustion Field-Erected** - As shown in Table 5-11, mass combustion field-erected technology received only one TM rating for the 15 evaluation factors: material recovery revenue (TM). It was noted that this technology has the capability to recover ferrous metal material after the incineration of the solid waste. Lack of interest in recovering this material arises not from technical difficulties, but rather from a lack of secondary market demand. Increased emphasis on using recycled iron and steel can make the recovery of these materials more attractive at mass combustion field-erected facilities. In summary, the TM rating received for material recovery revenue does not diminish the overall acceptable results of mass combustion field-erected technology. Therefore, this technology is classified as a preferred technology for solid waste disposal in the County.

TABLE 5-11

ACCEPTABLE SOLID WASTE DISPOSAL TECHNOLOGIES
RECEIVING TECHNOLOGICALLY MARGINAL OR TECHNOLOGICALLY
UNFAVORABLE RATINGS ON PHASE 3 FACTORS

Waste-to-Energy	
Mass Combustion Field-Erected	Material Recovery Revenue - TM
Mass Combustion Field-Erected with Preprocessing	Safety - TM Capital Cost - TM
Mass Combustion Modular	Warrantees/Guarantees - TM Material Recovery Revenue - TM Energy Recovery Revenue - TM Operation and Maintenance Cost - TM
Mass Combustion Modular with Preprocessing	Operation Complexity - TM Safety - TM Warrantees/Guarantees - TU Energy Recovery Revenue - TM Capital Cost - TM Operation and Maintenance Cost - TM Net Cost for Disposal - TM
RDF-to-Energy	
Spreader Stoker Combustion	Redundancy - TM Safety - TM Material Recovery Revenue - TM
Landfill	Land Area Requirements - TU Material Recovery Revenue - TM Regulatory Posture - TM

- **Mass combustion Field-Erected with Preprocessing** - As shown in Table 5-11, mass combustion field-erected with preprocessing technology received two TM ratings for the 15 evaluation factors: safety (TM) and capital cost (TM). The potential for safety problems associated with the use of a parallel preprocessing system is an important consideration. Safety problems such as fires, explosions, human contact with disease, and health risks bring about this rating. The capital cost rating reflects the extra significant investment necessary to implement a parallel preprocessing system with this technology. Due to the additional cost and upon considering the potential for effectiveness subsequent to an aggressive source separation and recycling program, this consideration is found to be marginal.

  Since the decision to utilize a preprocessing system is typically predicated upon the commitment to utilizing a mass combustion field-erected technology, it would be speculative at this time to define the equipment requirements and objectives of a preprocessing system for the County. Therefore, while mass combustion field-erected with preprocessing technology is preferred if the safety and capital cost factors are adequately considered, the remaining portion of the solid waste disposal technology evaluation, including Phase 4, will consider only mass combustion field-erected as preferred technology. No preprocessing will be assumed in the further analysis.

- **Mass Combustion Modular** - As shown in Table 5-11, mass combustion modular technology received four TM ratings for the 15 evaluation factors: A TM rating for warranties/guarantees arises from the historic inability of this technology to meet performance requirements and the typically limited financial capability of vendors to back the technology guarantees; A TM rating for material recovery revenue results from a similar situation as described under the mass combustion field-erected discussion earlier. TM rating for energy recovery revenue is indicative of the relatively low energy output and subsequent revenue from this technology. In addition, there is the issue of the capability of such a technology system to produce saleable electric power. Further, a TM rating for operation and maintenance cost

results from the usually higher maintenance requirements for this technology due to its relatively short equipment life and less durable construction.

In summary, the four TM ratings received can be considered significant enough to merit further examination of mass combustion modular as a preferred technology. As such, a comparison of mass combustion modular to its field-erected counterpart is warranted to determine whether the former is a preferred technology such as the latter. DGEIS, Volume III, Section H.5.3.1 of Appendix H presents this comparison of Waste to Energy (WTE) mass combustion field-erected and mass combustion modular technologies.

- **Mass Combustion Modular with Preprocessing** - As shown in Table 5-11, mass combustion modular technology with preprocessing received seven TM or TU ratings for the 15 evaluation factors: A TM rating for operational complexity is caused by compounding the operation and maintenance complexity of this technology with that of a preprocessing system. A TM rating for safety results from the reasons summarized under the mass combustion field-erected with preprocessing discussion. A TU rating for warranties/guarantees results from the reasons summarized in the preceding discussion along with consideration of the warranties/guarantees for the preprocessing system. A TM rating for energy recovery revenue results from the reason summarized in the preceding discussion. A TM rating for energy recovery revenue results from the reasons summarized in the preceding discussion. A TM rating for capital cost results from the reasons summarized under the mass combustion field-erected with preprocessing discussion. A TM rating for operation and maintenance cost results from the reasons summarized in the preceding discussion. A TM rating for net cost disposal reflects the effect of both a high operation and maintenance (O&M) cost and low energy recovery revenue.

  In summary, the seven TM or TU ratings received can be considered significant with regard to selecting mass combustion modular with preprocessing as a preferred technology.

- **Spreader Stoker Combustion** - As shown in Table 5-11, spreader stoker combustion technology received three TM ratings for the 15 evaluation factors: redundancy (TM), safety (TM), and material recovery revenue (TM): A TM rating for redundancy results from the historically lower on-line availability of this technology and the related need for greater redundancy. A TM rating for safety is determined based upon the problem documented with this technology such as fires and explosions in the front-end fuel preparation area. While newer facilities have made efforts to eliminate this danger, the record of safety problems in these facilities cannot be overlooked. A TM rating for material recovery revenue summarizes the largely equivalent performance of this technology to WTE technologies with this factor.

  In summary, the three TM ratings received for spreader stoker combustion merits a closer examination of this technology as a preferred one. As such, a field-erected technology was warranted to determine whether the former is a preferred technology such as the latter. The DGEIS, Section H.5.3.2 of Appendix H presents this comparison.

- **Landfill** - As shown in Table 5-11, landfill technology received three TM or TU ratings for the 15 evaluation factors: A TU rating for land area equipment requirements indicates that this technology has the greatest acreage requirements of all the acceptable technologies. A TM rating for material recovery revenue relates to the historically marginal ability of landfill technology to recover material and generate revenue from doing so. A TM rating for regulatory posture indicates the perception that NYSDEC will advocate thermal recovery over the choice of landfill technology.

  While landfill technology has received these ratings, the County will require some new landfill capacity regardless of the ultimate technologies chosen. Furthermore, landfill technologies received four TF scores, the highest among all acceptable technologies. Therefore, landfill technology is classified as preferred technology for solid waste disposal in the County.

5.5.5 SUMMARY - PREFERRED TECHNOLOGY RECOMMENDATIONS

With regard to the preferred technologies identified in Phase 3, the following assumptions were used for the remainder of the solid waste disposal technology evaluation.

- Mass combustion field-erected WTE is considered a preferred technology; No preprocessing was assumed (see Section 5.5.4). This technology was assessed further in Phase 4 evaluation.

- Mass combustion modular and mass combustion modular with preprocessing are considered acceptable technologies, but not preferred technologies. These were not considered further in the solid waste disposal technology evaluation. (See DGEIS, Appendix H.)

- Spreader stoker combustion is a preferred technology, however, the remaining portion of the SWDTE, including Phase 4, considers mass combustion, field-erected as the preferred incineration technology.

- As discussed in Section 5.5.4, landfill technology is identified as a preferred technology.

In summary, the preferred technologies for managing the resultant waste stream that were further evaluated included:

- **Mass combustion field-erected WTE**

- **Landfill**

These two preferred technologies were selected as a result of applying the criteria and evaluation approach contained in Phases 1, 2, and 3. Table 5-12 summarizes the overall results of Phases 1, 2, and 3 for each of the technologies with regard to key factors of importance.

5.6 ENVIRONMENTAL CONSIDERATIONS OF THE PREFERRED TECHNOLOGIES

All solid waste disposal technologies have the potential to create environmental impacts. Although recycling has the potential to create its own environmental impacts, the DGEIS, Section H.6 of Appendix H discusses only the environmental considerations associated with the two preferred solid waste disposal technologies identified in Phase 3: waste-to-energy (WTE) and landfill.

A WTE facility with its associated ash residue landfill must be designed to meet applicable federal, state, and local rules and regulations. The environmental considerations in DGEIS, Appendix H.6, are neither site-specific nor technology-specific, but are more generic in

TABLE 5-12

SOLID WASTE DISPOSAL TECHNOLOGY EVALUATION SUMMARY

Technology	General Technology Reliability	Minimization of Environmental Impacts	Technology Size Applicability	State of the Technology	Capital Cost	O&M Cost	Overall Recommendation to the County
Out of State Exportation on to Landfills	Low	Medium	High	Proven	Medium	High	Medium
Non-Candidate							
Material Recovery	Low	Medium	Low	Unproven	High	High	Low
Composting	Low	Medium	Medium	Partially	Medium	High	Low
Anaerobic Digestion	Low	Medium	Low	Proven Unproven	Medium	High	Low
Enzyme Hydrolysis	Low	Medium	Low	Unproven	High	High	Low
Pyrolysis	Low	Medium	Medium	Partially Proven	High	High	Low
Expansion of Existing Landfill Capacity	Medium	Medium	Low	Partially Proven	High	Low	Low
In-State Exportation to Landfills	Low	Medium	Low	Partially Proven	Medium	Medium	Low
Preferred							
Mass Combustion Field-Erected WTE	High	High	High	Proven	High	Medium	High
Mass Combustion Field-Erected WTE with Preprocessing	Medium	High	High	Proven	High	High	High
Spreader Stoker Combustion RDF-to-Energy	Medium	High	High	Proven	High	High	High
Landfill	High	High	High	Proven	Medium	Low	High
Acceptable							
Mass Combustion Modular WTE	Medium	High	Medium	Proven	Medium	High	Medium
Mass Combustion Modular WTE with Preprocessing	Medium	High	Medium	Proven	High	High	Medium
Candidate							
Material Recovery and RDF Production	Low	Medium	High	Partially Proven	Medium	High	Low
Material Recovery, RDF Production and Composting	Low	Medium	High	Partially Proven	High	High	Low
Fluidized Bed Combustion RDF-to-Energy	Medium	High	High	Partially	High	Medium	Medium

nature. The environmental impacts discussed in Appendix H.6 include an assessment of air, water, and land quality issues and health risks. Since the potential environmental impacts generated by each technology differ, it is difficult for them to be directly compared. For example, more information and data is available regarding air quality impacts from a WTE facility than from a solid waste landfill. Ground water impacts are typically of greater concern for a solid waste landfill than for a WTE facility.

In conclusion, design and operational measures are available to mitigate the general impacts expected from either of the preferred solid waste disposal technologies, and full consideration had been given to the technological, environmental, and economic aspects associated with the waste-to-energy incineration of municipal solid waste.

However, the UCRRA, with input from the Citizen's Advisory Committee (CAC), solid waste planning consultants, Ulster County Legislature, and the public, determined that the waste-to-energy alternative was not suitable for Ulster County because of economic reasons and environmental concerns. As discussed in this section, importing solid waste would help make a Waste-to-Energy facility more economically feasible. However, importation of solid waste from outside the County would create additional adverse environmental impacts and is clearly against the solid waste management policies as described in "The Plan". Given the above concerns, landfilling is more economically feasibly since solid waste importation is not acceptable to the County.

The UCRRA further determined that a non-burn solid waste management program that maximizes waste reduction and recycling to the extent technically and economically practical is preferable. One exception recognized by UCRRA is related to the incineration of regulated medical wastes (i.e., red bag wastes). Presently, incineration of regulated medical waste is recognized as a common practice and the only legal method. UCRRA intends to review this method to determine if there are more suitable options.

Therefore, either preferred technology is considered environmentally acceptable for implementation in the County. A site-specific and technology-specific environmental impact study and an associated health risk assessment would have to be undertaken after a decision on the preferred technology to be used is made.

5.7 SEWAGE SLUDGE DISPOSAL TECHNOLOGY EVALUATION

5.7.1 INTRODUCTION

In addition to the analysis of technologies for managing the resultant solid waste stream, an evaluation of sewage sludge disposal technologies was conducted. This evaluation addressed the sewage sludge generated from the existing wastewater treatment plants, and included septage produced in the County.

Septic tank systems are used to treat domestic wastewater for approximately 60% (by volume) of the County. In these systems, the wastewater is discharged to an underground septic tank, where solids and organic matter settles from the wastewater. The solids captured in the septic tank are referred to as septage. The septage is periodically removed from the tank and typically disposed of in leachate lagoons operated by private septage removal companies. The overflow from the tank enters an underground leaching field and leaches into the ground. The NYSDEC regulations require that all leaching lagoons for septage be lined and have a leachate collection system. The leachate from these lagoons must undergo treatment, usually at a publicly owned treatment works (POTW). Consequently, the County is assessing various alternatives for septage disposal and eliminating the use of private lagoons.

For the purposes of this discussion, it was assumed that septage would be introduced at the head end of the POTW and eventually become incorporated into the sludge produced. Thus, during the technical evaluation of sewage sludge disposal alternatives, septage was considered part of the POTW sludge.

There are several technologies for sludge disposal and treatment that are considered environmentally acceptable. These can be classified into three basic categories:

- Land application
- Process treatment
- Thermal reduction

- **Land Application** - In the direct application of sludge to land, the natural characteristics of soil are utilized to break down sludge into basic chemical elements which are subsequently recycled into the environment. Included in this category is landspreading.

- **Process Treatment** - Here, various physical, chemical, or biological processes (or combination thereof), are utilized to treat sludge. These processes greatly reduce the organic portion of the sludge and kill pathogens. Each treatment process produces a residual waste which requires either additional processing such as composting or final disposal such as landfilling.

- **Composting** - Composting with wood chips is the recommended treatment alternative considered in this evaluation. There is a substantial amount of wood chips available from the yard waste component of the County's waste stream to make this alternative viable.

- **Landfilling** - Landfills are primarily used as a final disposal alternative. Because there is anaerobic biological activity within the landfill, landfills may also be categorized as a process treatment alternative. For the purpose of this evaluation, the landfill alternative shall be included in the process treatment discussion.

- **Thermal Reduction** - The other sludge treatment category is thermal reduction by incineration. In this process, the volume of the sludge is greatly reduced through the combustion of the organic components. The incineration of sewage sludge produces two waste streams: flyash and bottom ash. The flyash is the lighter component of the ash residue which is transported out of the incinerator with the exhaust gas. The bottom ash is the ash residue remaining in the incinerator. These ash residues are comprised of the unoxidized organic and inorganic components of the sludge which require final disposal in a Part 360 Ash landfill. The DGEIS, Section H.7 of Appendix H, discusses in detail the various treatment alternatives, potential environmental effects, and identifies the alternatives that appear most appropriate for the County.

5.7.2 SUMMARY AND RECOMMENDATIONS

The preceding discussion and DGEIS, Section H.7 of Appendix H, describes the various sewage sludge disposal technologies generally available for the County. Based upon a technical and environmental assessment, it was recommended that the following technologies be considered as preferred and be subjected to further analysis in Phase 4 of the technology evaluation:

Preferred

- Process Treatment
- Composting
- Landfilling
- Thermal Reduction (Incineration)

Composting, landfilling, or incinerating the sewage sludge represents demonstrated means of disposal for this type of solid waste. Technologies that were not considered preferred include:

Non-Preferred

- Land Spreading
- Co-combustion with Solid Waste

5.8 COMPOSTING

5.8.1 INTRODUCTION

Composting takes advantage of, and accelerates the natural process of decay of organic matter to produce a stable, humus-like mixture suitable as a mulch or soil conditioner. A large volume of organic wastes such as leaves and yard wastes, food waste, and sewage sludge can be processed by composting.

Composting is a biological method of solid waste management that recycles organic waste through decomposition. Organic materials can be composted in a variety of ways as described below.

Composting was studied by UCRRA's consultant as a technology for the disposal of municipal solid waste, as well as a specific technology for recycling sewage sludge or yard waste, or a combination of them.

Composting as a technology to dispose of municipal solid waste was not designated a preferred technology because of lack of successful operating facilities in the United States. While there are operating facilities in other countries, a successful operating history in the United States was important because of the characteristics of municipal solid waste in this country and the collection and disposal technologies unique to the United States. According to the NYSDEC, a recent nationwide survey found eight operating municipal solid waste composting facilities in the United States, with sixty-seven in various stages of planning, design, or construction. There are no operating facilities in New York State (NYSDEC Solid Waste Management Plan 1989/1990 update - Responsive Summary, March 1990).

According to Biocycle magazine in its November, 1990 issue, twenty-nine projects are under consideration, twenty-three are in the planning-feasibility stage; ten are in design; fourteen in construction and projects are full-scale operating facilities. There are four research pilot projects. Biocycle found that a growing number of communities are investigating composting source separated organics. Operating experience for municipal solid waste composting systems has been difficult in some respects. Problems with separating systems, maintaining sufficient moisture levels in the compost process, odors, and unmarketable compost have been encountered. The cost of such composting systems has also been high. (Biocycle magazine, November and December 1990; "Operational

Challenges at MSW Composting Facilities", "Minnesota Facilities Meet MSW Composting Challenges".) However, development of a municipal organic waste composting facility is more feasible, and as discussed in Section 9.0 of this document, as a recommended initiative.

Sewage sludge composting is also a recommended technology and a yard waste composting program has been commenced by UCRRA.

This section reviews composting using as its basis the 1990 NYSDEC Generic Technology Review.

5.8.2 Alternative Composting Systems

Windrow System - Windrows are long piles of compostable materials, usually 12 feet wide and 6 feet high. The rows are kept moist and turned over to aerate the system, which promotes uniform decomposition and ensures that all the material decomposes at a satisfactory rate. Because of the amount of land area required and labor needed, windrow systems are most commonly used for yard wastes. Windrow composting of yard wastes produces a usable product in six months to two years, depending on the rate of decomposition. To accelerate decomposition, compostable materials can be shredded, nitrogen added (if needed), and the windrow turned over more. Frequently, these additional operations can shorten the time needed for decomposition to less than one year.

Aerated Static Pile - In this composting system, the material to be composted, usually sewage sludge, is typically mixed with a bulking agent such as wood chips, and formed into piles. A system of pipes underneath the piles are connected to blowers which force air through the piles which are usually covered with woodchips which provide a source of carbon, structural stability, and increased porosity for air flow. The microbes that metabolize and decompose organic wastes need aeration (oxygen) to prevent excessive heat buildup and remove moisture from the piles. With an aeration system, piles can be built wider and consume less land than a windrow system. When composting is complete, the piles are broken up and can be screened to remove the bulking agents.

In-Vessel Composting - Mechanical equipment is available that accelerates decomposition by controlling the flow of air and water. Some of these are enclosed and computer-controlled to further accelerate the decomposition process. Most of these systems are modular and fall into four major types:

a) agitated bed systems;
b) silo systems;
c) tunnel systems; and
d) enclosed static piles.

Agitated Bed Systems - Agitated bed systems use a shallow compost pile to minimize compaction, which in turn lessens the pressure requirements for aeration. The reactor flow is horizontal, and the design can be either rectangular or circular. In either case, the systems are sized for a 14-day retention time and provide intermittent mixing of the composted material.

Silo Systems - Silo systems are vertical plug flow reactors. The feed mixture is added to the top of the reactor, and air is typically forced upward through the compost and exhausted at the top. Like agitated bed systems, the design can be either rectangular or circular. Reduction of pathogens and volatile solids occurs in the upper portion of the reactor.

Tunnel Systems - Tunnel systems are horizontal plug flow reactors that receive waste materials from a conveyor. The reactor consists of rectangular concrete containers which can be stacked one on top of the other to reduce space requirements. The reactor is divided into four compartments and air is injected perpendicular to the waste flow. A hydraulic ram is used to create a cavity in which to add more waste. Tunnel systems are used primarily to compost sludge, but other wastes may be co-composted with the sludge.

Enclosed Static Pile Systems - Unlike other processes described above, enclosed static pile systems are stationary. Feed materials are added to each pile in a width-wise direction until the pile reaches a predetermined width. The piles compost for three weeks in an enclosed, insulated building. Finished compost is removed, screened, and sent to a curing and storage area.

Co-Composting - Co-composting means the simultaneous composting of two or more diverse waste streams, typically mixed municipal solid waste and sewage sludge. Co-composting of municipal solid waste with sludge is best handled in an enclosed system because of the potential for odors and the need for leachate collection. Sludge can also be mixed with chipped yard wastes which accelerates the process, because sludge is rich in nitrogen and woody wastes and leaves are rich in carbon. Both nitrogen and carbon are required for composting to occur with a carbon nitrogen ratio of 20:1 or 30:1 being best. Any co-composting requires careful design and management. Co-composting of municipal solid waste, in particular, requires a stringent program to remove household hazardous waste, which can interfere with the composting process and contaminate finished compost.

Backyard Composting - As part of the overall municipal solid waste management program, residents of Ulster County are encouraged to compost in their own yards. Backyard composters must have adequate outdoor space for the pile or bin.

Backyard composting is an excellent method of diverting grass clippings, leaves, tree trimmings, and some kitchen wastes (without meat, bones, or fatty foods) from the municipal waste collection system and disposal facility. A mixture of materials makes the best compost for plants. Backyard composting produces valuable materials for mulching and mixing soil to nourish flowers, vegetables, trees, and shrubs or for seeding new lawns or bare spots when carefully applied.

Community benefits include savings on collection and disposal of waste. However, composting requires some effort on the part of the householder, and information on the proper methods for backyard composting is provided by UCRRA or can be obtained from NYSDEC, the Ulster County Cornell Cooperative Extension office or local library.

5.8.3 TECHNOLOGY EVALUATION - APPLICABILITY/CAPACITY

Mixed Municipal Solid Waste - Composting can divert a significant portion of the waste stream from disposal, since approximately 40-50% of municipal solid waste is organic in nature and potentially compostable. The organic fraction of municipal solid waste includes paper, cardboard, food, and yard wastes. The municipal waste stream typically will require extensive processing prior to composting.

Furthermore, it is vital that household hazardous wastes must be removed prior to processing. A municipal solid waste composting facility will generated residues that must be properly disposed of, typically at a landfill.

Yard Wastes - Yard wastes can constitute from 15%-20% of the waste stream, and can be effectively composted. Leaves and yard waste are generated seasonally; therefore, collection would take place only during certain periods of the year.

Land requirements depend on the volume and types of yard waste to be composted and the type of equipment used for composting. Yard wastes usually are composted by the windrow method. For preliminary planning purposes, roughly one acre is needed for each 3,000 cubic yards of yard waste.

A solid waste management facility (Part 360) permit is not required for facilities that compost 3,000 cubic yards per year or less, which allows communities to try composting on a small scale without the additional expense of the permitting process.

Sewage Sludge - With the most recent enactment of the Federal Ocean Dumping Ban Act of 1988 and the concurrent landfill capacity crises, many communities are seeking alternative methods for managing sludge from wastewater treatment plants. Of those alternatives, composting is probably the fastest-growing. The number of communities that have begun sludge composting in the last six years has risen dramatically in New York State and continues to grow. Also, with less and less valuable land available for landspreading sewage sludge, particularly in heavily populated areas, composting is becoming an attractive alternative.

Sludge typically is composted by either the aerated static pile or in-vessel composting methods. For the aerated static pile method, approximately one acre of land is needed for each five dry tons of sludge composted. Good quality sludge and proper operational control are essential to the success of a sludge composting program.

5.8.4 RELIABILITY/EXPERIENCE

Mixed Municipal Solid Waste - Several communities in New York State are planning to compost their mixed municipal solid waste. Their experiences and the experiences of other communities in other states and other nations can be a valuable resource to those who are considering municipal waste composting. At present, composting of mixed municipal solid waste has had limited success.

There are several factors to consider prior to municipal waste composting:

- A number of physical, chemical, and biological conditions must be carefully controlled in order for the waste to compost properly. Because municipal solid waste is heterogeneous, waste must usually be processed before or, in some cases, after it is composted. The purpose of the processing is to remove as much of the inorganic fraction of the waste as practical and to make the organics a uniform size;

- As with any recyclable, the compost product must be effectively marketed. Multiple outlets for the materials should be identified prior to operation of the facility. Municipalities should use it in public works and highway projects;

- Compost must be monitored carefully to ensure that it meets regulatory requirements; compost must not exceed regulatory limits for heavy metals and organic compounds. Compost that does not meet the applicable standards cannot be used for its intended purpose. NYSDEC also requires that a sufficiently high temperature be maintained in the material in order to destroy viral, bacterial, and parasitic pathogens. Additional requirements apply depending on the composting method used.

- Entering refuse must be well-characterized prior to facility design. Excessive amounts of commercial, non-putrescible or other waste components will affect the sizing of the facility components and the composting process;

- Municipal solid waste composting facilities tend to be very mechanically oriented; therefore, the separation and processing equipment used prior to composting must be reliable. Facilities have experienced operational problems with front-end separation and shredding equipment in particular;

- A municipal solid waste composting facility does not eliminate the need for a sanitary landfill. A landfill must be available to accept by-pass waste from facility shutdown, unmarketable compost and uncompostable wastes.

Yard Waste - Yard waste is relatively easy to compost and can be effective because leaves, a major portion of yard wastes, usually are collected separately and readily degrade. Leaf composting methods are well-documented in terms of facility design and control. Composting leaves is a good way for the community to begin composting and make a significant decrease in the waste stream destined to be landfilled.

Sewage sludge - Before 1983, sludge composting was practiced by only a handful of communities. Since then, many communities have implemented sludge composting projects, and many more are in the planning stages. Sludge composting is a proven technology with worries about marketing the sludge taking a back seat to odor control as the major concern. However, much research is currently underway to develop effective operational methods and odor control systems. Several methods have been found effective.

Marketing the sludge appears to be less of a problem than it used to be, with most composted sludge now going to landscaping and general contractors, public works projects, nurseries, and homeowners.

5.8.5 SYSTEM COST

The costs of composting can vary considerably, depending upon the size and type of facility and the wastes being composted.

Municipal Solid Waste - Limited cost information is available on the capital and operating costs of mixed municipal solid waste composting. For municipal waste composting, capital costs vary widely for an in-vessel facility, but can be estimated at $50,000-$75,000 per ton per day of design capacity. The operation and maintenance costs, exclusive of the revenue received from the sale of compost and other recyclables, can be estimated at $35-$45 per ton. Costs include pre-processing of the waste prior to composting, which may

involve shredding, screening, and magnetic separation. The estimated operation and maintenance costs include labor, electricity, fuel, maintenance, monitoring, material supplies, water, administrative costs, building maintenance and renewal, and replacement costs. Annual debt service and landfilling costs must be added to the estimated operation and maintenance (O&M) costs. Capital and other costs can vary significantly with the amount of pre-processing required, the equipment used, and amount of waste or compost that must be landfilled.

Yard Waste - Cost for yard waste composted by the windrow method range from $4.00 - $6.00 per cubic yard, depending upon the size of the facility. Paradoxically, the cost does not get cheaper as the facility gets larger. A large facility (over 30,000 tons per year) will cost about $6.00 per cubic yard to process wastes. Yard waste composting costs include: land, land improvements, equipment usage, initial windrowing, combining windrows, water application, second windrow turning, curing pile formation, shredding and screening, insurance, supplies, contingencies, and overhead.

Sewage Sludge - Costs of composting sludge vary considerably depending upon the method used. Biocycle magazine conducts an annual survey of sewage sludge composting facilities. According to the 1988 survey, the cost per dry ton for aerated static pile facilities ranged from $59 to $300 with most costs falling between $125 and $175. The average windrow composting project had operating costs of $130 per dry ton with costs ranging from $80 to $158. In-vessel sludge composting costs ranged from $71 to $325 per dry ton with the average being $175 per dry ton.

5.8.6 SUMMARY

Table 5-13a lists the advantages and disadvantages of the various types of composting. A municipal solid waste composting facility will not meet all solid waste disposal needs. A composting facility will not eliminate the need for a landfill, since one is needed to handle by-pass wastes, materials unsuitable for composting, and unsuitable compost. Also, composting is not cost-free; it can require major investment in equipment and process control in order to ensure that it works properly. If composting is to be pursued, UCRRA also must ensure the availability of reliable markets or uses for the

composted material as a first condition in the consideration of composting on a large scale.

Composting of mixed municipal waste also requires careful pre-processing of the waste stream and vigilant monitoring of conditions during composting. However, with proper pre-processing and process control, composting can cycle a significant portion of the solid waste stream.

Composting does not reduce the volume of waste as much as a waste-to-energy plant. It transforms waste into a usable organic material which, if processing conditions are assiduously maintained, can be marketed.

Table 5-13a

COMPOSTING

Advantages	Disadvantages
I. All Types	I. All Types
All composting can produce a useful soil enricher to use for public parks, lawns, and residents or plant nurseries.	Odors are a potential problem
	More compost may be produced than there is a use for; marketing may help overcome this disadvantage.
II. Municipal Solid Wastes	II. Municipal Solid Wastes
Same as I: Reduces the amount of waste which need landfilling or other types of disposal.	Typically, this is very equipment-oriented and, therefore, reliable and proper sizing are critical.
III. Yard Wastes	III. Yard Wastes
Composting eliminates the need to dispose of a large seasonal waste stream.	High costs.
The compost can often be sold to residents or plant nurseries, thereby reducing the processing costs.	Monitoring is crucial to prevent heavy metal content from rendering compost unmarketable.
	Facility siting may be difficult in urbanized areas.
IV. Backyard	IV. Backyard
If residents compost in their yards, the municipality doesn't have to collect and dispose of the waste, thus saving costs for these services.	Adequate space is needed for a compost bin or pile.
Backyard composting produces a valuable material for mulching and mixing with soil to nourish flowers, vegetables, trees, and shrubs, or for seeding new lawns or bare spots.	Care must be exercised in composting kitchen wastes so as not to attract flies or animals.
Backyard composting instills good recycling habits in children.	

Source: New York Department of Environmental Conservation Division of Solid Waste.

5.9 PHASE 4: IDENTIFICATION OF RECOMMENDED TECHNOLOGIES

The purpose of the Phase 4 evaluation was to identify a recommended solid waste management approach to provide for the County's solid waste management needs. Additional objectives of the Phase 4 evaluation were to select a recommended technology from among the preferred technologies identified for the resultant solid waste stream, and to evaluate the economics of the preferred technologies identified for sewage sludge disposal. The Agency's consultant performed the Phase 4 evaluation utilizing a Base Case and several sensitivity analyses.

The selection of a recommended system of technologies was based upon the results of life-cycle cost analyses for a range of possible solid waste management approaches comprised of the following:

a. Aggressive recycling program

b. Preferred processing/disposal technology for the resultant solid waste stream

c. Preferred processing/disposal technology for the sewage sludge waste stream (if the recommended technology is sludge composting)

d. Landfill

The balance of this section includes the following:

- A summary of the proposed recycling programs and the preferred technologies selected for the resultant waste stream and for the sewage sludge waste stream;

- Identification of five solid waste management approaches or "themes" comprised of systems of technologies which shall be used to represent the range of possible solid waste management approaches capable of providing for the County's solid waste needs; and

- Economic comparison of the five identified solid waste management approaches based on the results of a life-cycle cost analysis.

It should be noted that a potential component of the County's solid waste management program could be the development of a transfer station system. However, the need, if any, for such a system will be largely dependent upon the location of processing facilities and the direction of the recycling program.

5.9.1 REVIEW OF PROPOSED RECYCLING PROGRAMS AND OTHER PREFERRED SYSTEM COMPONENTS

Recycling - As described in Sections 4.0 and 9.0 of this document, the proposed recycling plan is an aggressive program designed to maximize recycling and waste reduction initiatives to the extent technically and economically practical.

To meet the maximization goal, the recycling plan depends upon the development of additional markets for recyclable materials.

For the purpose of performing the life-cycle cost analyses, it was necessary to make some assumptions regarding the development of the County's solid waste management program. In terms of recycling, it was assumed that the program adopted by the County would be comprised of the following major elements:

- An intermediate processing center (IPC) now known as the Satellite Aggregation Center (SAC);
- A recycling program for portions of the construction and demolition waste stream;
- A leaf and grass composting and yard waste chipping program; and
- A sludge composting program.

In addition, costs of alternative preferred sludge disposal technologies, (i.e., landfilling and incineration) were also addressed.

Technologies for Processing the Resultant Solid Waste Stream - As described in the Phase 3 evaluation, two preferred technologies were identified for processing and/or disposal of the resultant waste stream: (1) landfilling and (2) a waste-to-energy facility with associated landfill.

Sewage Sludge Waste Stream - Three preferred technologies were identified for processing and/or disposal of the County's non-hazardous sewage sludge:

- Landfilling
- Composting
- Incineration

Summary of Major Assumptions For Incineration Analysis

Prevent safety hazards

Control vectors, dust and odors.

Minimum of three days of storage capacity provided in storage pit or equivelant storage area.

Three process train minimum, unless costs exceed benefits.

All putrescible waste storage in enclosed area.

Negative pressure in storage/tipping area.

Oversize, bulky and bypass waste disposed of at a permitted facility.

Adequate drainage to prevent ponding.

Personnel training.

Maintain records and file reports.

Semi - annual testing of combined ash residue.

Ash residue management plan.

Ash residue co-disposed with solid waste in a double composite liner landfill or disposed in a monofill having a single composite liner.

Maintain adequate separation distances from property boundaries.

Table 5 - 15

Summary of Major Assumptions For Composting Analysis

Prevent safety hazards.

Pathogen reduction.

Control leachate.

Control site access by fencing, gates, signs, or other suitable means.

Control vectors, dust and odors.

Compost pile insulated and temperature greater than 131° maintained throughout one mixture for at least 3 consecutive days.

Temperature monitoring daily. Monitor 6 - 8 inches below the pile surface and 6 - 8 inches from outlet of the aeration pipe.

Finished compost must be stable and contain no sharp objects.

Maintain records and file reports.

Class I and Class II compost testing.

Monthly testing for following parameters : mercury, cadmium, nickel, lead, chromium (total), copper, zinc, PCB's.

Minimum process detention time of 50 days.

Compost cannot be used on crops grown for direct human consumption.

Testing for chlorides, flourides, and sulfates.

Maintain adequate separation distances from property boundaries.

Weekly testing for parameters : total slids, total volitale solids, nitrate, nitrite, phosphorous, potassium, ph, and nitrogen.

5.9.2 DEVELOPMENT OF ALTERNATIVE SOLID WASTE MANAGEMENT APPROACHES

Five alternative solid waste management approaches were identified for evaluation in this subsection. Each of these approaches was developed based upon one of the following themes:

Theme 1: Landfill with Aggressive Recycling and Expanded Markets
Theme 2: Landfill with Aggressive Recycling and Existing Markets
Theme 3: WTE Facility Minimization
Theme 4: Integrated Approach
Theme 5: Landuse/Landfill Minimization

Theme 1 assumed a goal of maximizing recycling of the County's solid waste stream by 1997 based on an optimistic assumption of expanded recycling markets. Themes 2, 3, 4 and 5 all assumed a goal of 40% recycling of the County's solid waste stream by 1997.

For the purposes of the cost analyses, the recycling facility associated with each theme was sized to handle the estimated volume of materials consistent with the recycling goal for that theme with a maximum of two eight-hour shifts, five days per week. In addition, the remaining components of each theme, either a landfill, or a waste-to-energy facility and a landfill, were sized so that the total waste processing and disposal capacity of the County's solid waste management system, recycling/landfill/waste-to-energy (if applicable), is equal to 110% of the anticipated waste stream over the planning period after allowances for annual downtime. This additional, conservative planning factor provided further assurance that the facilities will have adequate capacity. In order to address unanticipated increases in solid waste quantities, or unplanned shortfalls in meeting the County's recycling goals, each theme also included purchase of a minimum of 20 additional acres of land suitable for landfill expansion. This inclusion provided an additional safety factor which does not significantly impact the financial analyses as no monies were included for landfill development on the additional acreage. The idea was to "land bank" additional space. This additional acreage corresponded to disposal capacity for approximately 15% of the anticipated waste stream over the planning period.

Under Themes 1 and 2, all solid waste which was not recycled was landfilled. Themes 3, 4 and 5 included the development of a waste-to-energy facility with an associated landfill. The size of the waste-to-energy

facility in Themes 3, 4 and 5 was determined based on either being conservative in the sizing of the landfill, or being conservative in the sizing of the waste-to-energy facility. . For example, under Theme 3, conservatism was applied to the sizing of the landfill. Theme 3 represented a policy decision which assured that the waste-to-energy facility will not be oversized under a combination of assumptions, each of which would reduce the processible waste stream requiring disposal or would reduce the needed waste-to-energy facility capacity (e.g., the County's recycling program will achieve its goals, waste reduction plans will be fully successful, the waste-to-energy facility will perform at an 80% annual availability, and the waste-to-energy facility will be sized based on recycled processible waste quantities generated in the first full year of operation). This approach resulted in a waste-to-energy facility size of 400 tpd. It should be noted here that waste-to-energy facilities, many of them in the early years of operation, have shown an availability of more than 80% (some, such as Dutchess County's, as high as 93%). However, in planning for the entire twenty year period, it was felt that facility efficiency and availability may decline as the facilities age. Therefore, a more conservative availability factor was used.

Under Theme 4, conservative assumptions are shared between the two facilities, resulting in a waste-to-energy facility size of 600 tpd. Under Theme 5, conservative assumptions are applied to the waste-to-energy facility. This approach results in a waste-to-energy facility size of 800 tpd.

The amount of conservatism applied to the waste-to-energy facility sizing under each theme was determined by varying the following assumptions or parameters:

- Growth in per capita waste generation rates
- Recycling program achievements
- State waste reduction achievements
- WTE facility design year
- WTE facility annual availability
- Quantity of out-of-County spot market waste accepted by the facility.

Table 5-16 lists the assumptions made for each of these variables in the sizing of the corresponding waste-to

TABLE 5-16

GOALS AND DESIGN ASSUMPTIONS USED IN DEVELOPING
ALTERNTIVE SOLID WASTE MANAGEMENT APPROACHES

Theme	Goals	Change in Waste Generation Rate (#/cap/day)	Recycling Percentage Used for WTE and LF Sizing	Sewage Sludge Technology	Resultant Waste Stream Technology	WTE Design Year	WTE Annual Avail.	Out-of County Spot Market Waste
Landfill with Aggressive Recycling and Expanded Markets	Maximize Recycling	Increase 0.5 Percent/Year	50%	Compost	Landfill	n/a	n/a	no
Landfill with Recycling and Existing Markets	Meet State's Recycling Goals Landfill All Non-Recyclable Solid Wastes	Increase 0.5 Percent/Year	40%	Compost or Landfill	Landfill	n/a	n/a	no
WTE Minimization	Meet State's Recycling Goals Reduce Volume of Materials to be Landfilled and Recover Saleable Energy by Utilizing WTE Technology Avoid Possibility of any Excess Capacity in the WTE, Landfilling of Significant Quantities of Raw Waste is Acceptable	No Growth	40%	Compost, Landfill or Incinerate	WTE and Landfill	1995	85%	no
Integrated Approach	Meet State's Recycling Goals Reduce Volume of Materials to be Landfilled and Recover Saleable Energy by Utilizing WTE Technology Size WTE to Reduce Landfilling of Processable Waste to Less than Ten Percent in the Maximum year (2014)	Increase 0.5 Percent/Year	30* %	Compost, Landfill or Incinerate	WTE	2005	80%	Yes, up to 15% of Facility Capacity in Early Years
Landuse/Landfill Minimization	Meet State's Recycling Goals Reduce Volume of Materials to be Landfilled and Recover Saleable Energy by Utilizing WTE Technology Virtually Avoid Landfill of any Raw Processable Waste	Increase 1.0 percent/year	20*%	Incinerate	WTE	2005	75%	Yes, up to 50% of Facility Capacity

Notes: WTE = waste-to-energy
LF = Landfill
*The 30% and 20% recycling assumptions are only used for sizing the WTE and landfill components, and not the recycling component which is sized for meeting the state goal of 40% by 1997.

-energy facility for Themes 3, 4 and 5. These assumptions were made solely for sizing the waste-to-energy facilities. Later in this section when cost analyses are performed, assumptions are presented for each of these parameters.

It should be noted that the sizing and cost analysis of the solid waste disposal technologies (i.e., recycling, landfill and waste-to-energy) comprising the five themes described in this section were developed based upon available information pertaining to waste quantities and cost estimated for the development and implementation of the recycling, landfill and waste-to-energy components. This information provided a basis for making comparisons among the alternatives available and identifying a preferred approach for solid waste management in the County. When the County moves forward with implementing one or more of these components, the actual size and cost of the facilities will be determined based upon updated information pertaining to that alternative (i.e., waste quantities, facility size, procurement approach, financing alternatives, etc.).

Table 5-17 identifies the individual components of each Theme.

Tables 5-18, 5-19, 5-20, 5-21 and 5-22 present a summary of information for Themes 1, 2, 3, 4 and 5 respectively.

The following provides a brief discussion of each theme:

Theme 1: Landfill with Aggressive Recycling and Expanded Markets

The recycling component which gave this theme its name is the aggressive recycling program, which assumed expanded recycling markets.

In addition to the recycling components, this theme included development of a state-of-the-art sanitary landfill in accordance with current 6 NYCRR Part 360 requirements. This landfill would handle all non-recycled solid waste. A landfill size of approximately 150 acres including buffer was estimated for the purposes of developing the life cycle cost analysis.

Theme 2: Landfill with Aggressive Recycling and Existing Markets

This theme had the following goals:

- To meet a recycling goal of 40% recycling by 1997 and

TABLE 5-17

ALTERNATIVE SOLID WASTE MANAGEMENT APPROACH COMPONENTS

Theme	Major Components
Landfill with Aggressive Recycling and Expanded Markets	Recycling program designed to recycle 50% of the County's waste stream after 1997. Composting facility and/or landfill for sewage sludge. Approximately 150 acre raw waste landfill. Economic analysis assumes purchase of 250 total acres.
Landfill with Aggressive Recycling and Existing Markets	Recycling program designed to recycle 40% of the County's waste stream after 1997. Composting facility and/or landfill for sewage sludge. Approximately 175 acre raw waste landfill. Economic analysis assumes purchase of 250 total acres.
WTE Minimization	Recycling program designed to recycle 40% of the County's waste stream after 1997. Composting facility and/or landfill for sewage sludge, or separate sludge incinerator. 400 tpd WTE facility. Approximately 115 acre landfill for nonprocessible, bypassed and separate ash residue disposal. Economic analysis assumes purchase of 200 total acres.
Integrated Approach	Recycling program designed to recycle 40% of the County's waste stream after 1997. Composting facility and/or landfill for sewage sludge, or separate sludge incinerator. 600 tpd WTE facility. Approximately 95 acre landfill for non-processible, bypassed and separate ash residue disposal. Economic analysis assumes purchase of 200 total acres.
Landuse/Landfill Minimization	Recycling program designed to recycle 40% of the County's waste stream after 1997. Separate sludge incinerator. 800 tpd WTE facility. Approximately 105 acre landfill for non-processible, bypassed and separate ash residue disposal. Economic analysis assumes purchase of 200 total acres.

TABLE 5-18

SUMMARY OF ASSUMPTIONS AND GENERAL INFORMATION FOR
THEME 1: LANDFILL WITH AGGRESSIVE RECYCLING AND EXPANDED MARKETS

Planning Period: 1994-2014

Qty Solid Waste: 5,500,000 tons

Qty Sludge: 370,000 tons

Total Waste: 5,870,000 tons

Total Land Purchase used in Economic Analysis: 250 acres

Recycling

See Volume IV, Recycling Action Plan, for details.

General Components:
- Intermediate Processing Center (IPC)
- Construction and Demolition Debris Recycling
- Leaf and Grass Composting
- Yard Waste Chipping Program
- Sewage Sludge Composting Program (as described below)

Expanded recycled material markets for 50% of total waste.
Approximate acreage (including buffer): 90 acres

Sewage Sludge Composting

Facility Size: 55 tpd (wet)

Technology Type: Aerated static pile and screening

Operation Schedule: 8 hr/day, 6 days/week, 52 weeks/year

Estimated Capital Cost ($1988): $8,600,000

Estimated Operation & Maintenance Costs ($1988): $1,200,000

Number Full Time Employees: 10

Compost Market: Product is made available to markets or the public at no charge (no sales revenue)

Bulking Agent: Wood chips from yard waste chipping program

Landfill

Odor control: Yes, daily cover required buffering

Facility Acreage (including buffer): 30 acres (included under the 90 acres in recycling)

Accepted Wastes: Non-processable, bypass, recycling material rejects, recycled material (if no market exists), compost (if no market exists)

Design Parameters: Meets or exceeds all NYSDEC requirements for sanitary landfilling

Average Fill Depth: 60 feet

Operation Schedule: 8 hr/day, 6 days/week, 52 weeks/year

Estimated Capital Cost ($1988): $63,000,000

Estimated Operation & Maintenance Cost ($1988): $2,000,000

Number Full Time Employees: 12

Facility acreage (including buffer): 150 acres

TABLE 5-19

SUMMARY OF ASSUMPTIONS AND GENERAL INFORMATION FOR
THEME 2: LANDFILL WITH AGGRESSIVE RECYCLING AND EXISTING MARKETS

Planning Period: 1994-2014

Qty Solid Waste: 5,500,000 tons

Qty Sludge: 370,000 tons

Total Waste: 5,870,000 tons

Total Land Purchase used in Economic Analysis: 250 acres

Recycling

See Volume IV, Recycling Action Plan, for details.

General Components:
- Intermediate Processing Center (IPC)
- Construction and Demolition Debris Recycling
- Leaf and Grass Composting
- Yard Waste Chipping Program
- Sewage Sludge Composting Program (as described below)

Existing recycled material markets for 40% of total waste.
Approximate acreage (including buffer): 65 acres

Sewage Sludge Composting

Facility Size: 55 tpd (wet)

Technology Type: Aerated static pile and screening

Operation Schedule: 8 hr/day, 5 days/week, 52 weeks/year

Estimated Capital Cost ($1988): $8,600,000

Estimated Operation & Maintenance Costs ($1988): $1,200,000

Number Full Time Employees: 10

Compost Market: Product is made available to markets or the public at not charge (no sales revenue)

Bulking Agent: Wood chips from yard waste chipping program

Odor Control: Yes, blowers and filters, required buffering

Landfill

Facility Acreage (including buffer): 30 acres (included under the 65 acres in recycling)

Accepted Wastes: Non-processable, bypass, recycling material rejects recycled material (if no market exists), compost (if no market exists)

Design Parameters: Meets or exceeds all NYSDEC requirements for sanitary landfilling

Average Fill Depth: 60 feet

Operation Schedule: 8 hr/day, 5 days/week, 52 weeks/year

Estimated Capital Cost ($1988): $87,000,000

Estimated Operation & Maintenance Cost ($1988): $2,500,000

Number Full Time Employees: 15

SUMMARY OF ASSUMPTIONS & GENERAL INFORMATION FOR THEME 3: WTE MINIMIZATION

Planning period: 1994 - 2014

Qty. Solid Waste: 5,500,000 tons

Total Waste: 5,870,000 tons

Total Land Purchase: 200 Acres

Recycling

General Components:
- Intermediate Processing Center (IPC)
- Construction & Demolition Debris Recycling
- Leaf & Grass Composting
- Yard Waste Chipping Program

Existing recycled material markets for 40% of total waste.
Approximate acreage (including buffer) : 65 acres.

WTE
- o Facility Nameplate Size: 400 tpd
- o Technology Type: Mass combustion field-erected (2 process trains)
- o Preprocessing: not included in estimate costs, could be added
- o Operation Schedule: 24 hr/day, 7 days/week, 52 weeks/yr
- o Estimated Capital Cost ($1988): $36/ton
- o Gross Electric Power Generation to CHG&E: 500 kwh/ton
- o Net Electric Power Generation to CHG&E: 450 kwh/ton 90 % County / 10 % Operator
- o Stream Sales: No
- o Number of Full Time Employees: 35
- o Air Pollution Control System: Dry scrubber, fabric filter baghouse
- o Total residue generation incl. APC residue & 25% H2o : 106 tons per day
- o Approximate percent Weight Reduction: 75%
- o Facility Acreage (including buffer): 20 acres

Sewage Sludge Composting
- o Facility Size: 55 tpd (wet)
- o Technology Type: Aerated static pile & screening
- o Operation Schedule: 8hr/day, 6 days/week, 52 weeks/year
- o Estimated Capitol Cost ($1988): $8,600,000
- o Est. Operation & Maintenance Costs ($1988): $1,200,000
- o Number of Full Time Employees: 10
- o Compost Market: Product is made available to markets or public at no charge (no sales revenue)
- o Bulking Agent: Wood chips from yard waste
- o Odor Control: Yes, blowers & filters, required buffering
- o Facility Acreage (including buffer) 30 acres (included under the 65 acres in recycling)

Landfill
- o Accep ted Wastes: Non-processable, bypass, recycling material rejects recycled material (if no market exists), ash residue (in a separate "ashfill" cell).
- o Design Parameters: Meets or exceeds all NYSDEC requirements for sanitary landfilling
- o Average Fill Depth: 60 feet
- o Operation Schedule: 8 hr/day, 6 days/week, 52 weeks/year
- o Estimated Capital Cost ($1988): $45,000,000
- o Estimated Operation & Maintenance Cost ($1988): $1,700,000
- o Number of Full Time Employees: 10
- o Facility acreage (including buffer): 155 acres

TABLE 5-21

SUMMARY OF ASSUMPTIONS & GENERAL INFORMATION FOR THEME 4: INTEGRATED APPROACH

Planning period: 1994 - 2014

Qty. Solid Waste: 5,500,000 tons

Total Waste: 5,870,000 tons

Total Land Purchase: 200 Acres

Recycling
General Components:
- Intermediate Processing Center (IPC)
- Construction & Demolition Debris Recycling
- Leaf & Grass Composting
- Yard Waste Chipping Program
- Sewage Sludge Composting Program (as described below)

Existing recycled material markets for 40% of total waste.
Approximate acreage (including buffer) : 65 acres.

WTE
- o Facility Nameplate Size: 600 tpd
- o Technology Type: Mass combustion field-erected (2 process trains)
- o Preprocessing: not included in estimate costs, could be added
- o Operation Schedule: 24 hr/day, 7 days/week, 52 weeks/yr
- o Estimated Capital Cost ($1988): $72,000,000
- o Estimated Operation & Maintenance Costs ($1988) $32/ton
- o Gross Electric Power Generation: 500 kwh/ton
- o Net Electric Power Generation to CHG&E: 450 kwh/ton 90 % County / 10 % Operator
- o Stream Sales: No
- o Number of Full Time Employees: 50
- o Air Pollution Control System: Dry scrubber, fabric filter baghouse
- o Total residue generation incl. APC residue & 25% H2o : 158 tons per day
- o Approximate percent Weight Reduction: 75%
- o Facility Acreage (including buffer): 25 acres

Sewage Sludge Composting
- o Facility Size: 55 tpd (wet)
- o Technology Type: Aerated static pile & screening
- o Operation Schedule: 8hr/day, 6 days/week, 52 weeks/year
- o Estimated Capitol Cost ($1988): $8,600,000
- o Est. Operation & Maintenance Costs ($1988): $1,200,000
- o Number of Full Time Employees: 10
- o Compost Market: Product is made available to markets or public at no charge (no sales revenue)
- o Bulking Agent: Wood chips from yard waste
- o Odor Control: Yes, blowers & filters, required buffering
- o Facility Acreage (including buffer) 30 acres (included under the 65 acres in recycling)

Landfill
- o Accepted Wastes: Non-processable, bypass, recycling material rejects recycled material (if no market exists), ash residue (in a separate "ashfill" cell).
- o Design Parameters: Meets or exceeds all NYSDEC requirements for sanitary landfilling
- o Average Fill Depth: 60 feet
- o Operation Schedule: 8 hr/day, 6 days/week, 52 weeks/year
- o Estimated Capital Cost ($1988): $26,000,000
- o Estimated Operation & Maintenance Cost ($1988): $1,400,000
- o Number of Full Time Employees: 8
- o Facility acreage (including buffer): 95 acres

TABLE 5-22

SUMMARY OF ASSUMPTIONS & GENERAL INFORMATION FOR THEME 5: LANDUSE/LANDFILL MINIMIZATION

Planning period: 1994 - 2014

Qty. Solid Waste: 5,500,000 tons

Qty. Sludge : 370,000 tons

Total Waste: 5,870,000 tons

Total Land Purchase: 200 Acres

Recycling

General Components:
- Intermediate Processing Center (IPC)
- Construction & Demolition Debris Recycling
- Leaf & Grass Composting
- Yard Waste Chipping Program
- Sewage Sludge Composting Program (as described below)

Existing recycled material markets for 40% of total waste. Approximate acreage (including buffer) : 65 acres.

WTE
- o Facility Nameplate Size: 800 tpd
- o Technology Type: Mass combustion field-erected (3 process trains)
- o Preprocessing: not included in estimate costs, could be added
- o Operation Schedule: 24 hr/day, 7 days/week, 52 weeks/yr
- o Estimated Capital Cost ($1988): $96,000,000
- o Estimated Operation & Maintenance Costs ($1988) $28/ton
- o Gross Electric Power Generation: 500 kwh/ton
- o Net Electric Power Generation to CHG&E: 450 kwh/ton 90 % County / 10 % Operator
- o Stream Sales: No
- o Number of Full Time Employees: 50
- o Air Pollution Control System: Dry scrubber, fabric filter baghouse
- o Total residue generation incl. APC residue & 25% H2o : 211 tons per day
- o Approximate percent Weight Reduction: 75%
- o Facility Acreage (including buffer): 30 acres.

Sewage Sludge Composting
- o Facility Size: 55 tpd (wet)
- o Technology Type: Aerated static pile & screening
- o Operation Schedule: 8hr/day, 6 days/week, 52 weeks/year
- o Estimated Capitol Cost ($1988): $8,600,000
- o Est. Operation & Maintenance Costs ($1988): $1,200,000
- o Number of Full Time Employees: 10
- o Compost Market: Product is made available to markets or public at no charge (no sales revenue)
- o Bulking Agent: Wood chips from yard waste
- o Odor Control: Yes, blowers & filters, required buffering
- o Facility Acreage (including buffer) 30 acres (included under the 65 acres in recycling)

Landfill
- o Accep ted Wastes: Non-processable, bypass, recycling material rejects recycled material (if no market exists), ash residue (in a separate "ashfill" cell).
- o Design Parameters: Meets or exceeds all NYSDEC requirements for sanitary landfilling
- o Average Fill Depth: 60 feet
- o Operation Schedule: 8 hr/day, 6 days/week, 52 weeks/year
- o Estimated Capital Cost ($1988): $35,000,000
- o Estimated Operation & Maintenance Cost ($1988): $1,600,000
- o Number of Full Time Employees: 9
- o Facility acreage (including buffer): 105 acres

- To landfill all non-recyclable solid waste.

The recycling component of this theme is an aggressive recycling program assuming existing markets. Landfill design was assumed to be developed in accordance with current 6 NYCRR Part 360 requirements. A landfill size of approximately 175 acres including buffer was estimated for the purposes of developing the life cycle cost analysis.

Theme 3: WTE Facility Minimization

This theme had the following goals:

- To meet a recycling goal of 40% recycling by 1997;
- To process some of the waste and recover energy in a 400 tpd WTE facility; and
- To landfill all non-recyclable, non-processed, and ash residue waste.

The recycling component of this theme is an aggressive recycling program assuming existing markets. WTE facility and landfill design were assumed to comply with the current state regulations. A landfill size of approximately 115 acres including buffer was estimated for the purposes of developing the life cycle cost analysis.

Theme 4 - Integrated Approach

This theme had the following goals:

- To meet a recycling goal of 40% recycling by 1997;
- To process most County processible waste and recover energy in a 600 tpd WTE facility; and
- To landfill all non-processible and ash residue waste.

The recycling component of this theme is described as an aggressive recycling program assuming existing markets. WTE facility and landfill design were assumed to comply with the current state regulations. A landfill size of approximately 95 acres including buffer was estimated for the purposes of developing the life cycle cost analysis.

Theme 5: Landuse/Landfill Minimization

This theme had the following goals:

- To meet a recycling goal of 40% recycling by 1997;
- To ensure virtually all County processible waste is delivered to an 800 tpd WTE facility (i.e., no landfilling of processible waste); and
- To landfill all non-processible and ash residue waste.

The recycling component of this theme is an aggressive recycling program assuming existing markets. WTE facility and landfill design were assumed to comply with the current state regulations. A landfill size of approximately 105 acres including buffer was estimated for the purposes of developing the life cycle cost analysis. This theme accepted significant out-of-County waste, especially in the early years. (Acceptance of out-of-county waste is not a recommended strategy).

5.9.3 BASE CASE LIFE-CYCLE COST ANALYSES

A base case life cycle cost analysis was performed for each of the five individual themes. These detailed base case life cycle cost analyses are provided in Appendix K of the Draft GEIS.

These life cycle cost analyses evaluated the capital and operating costs of the themes over the planning period. These analyses included the costs associated with the components included in each theme (e.g., recycling, landfill, composting and, if applicable, waste-to-energy). The purpose of these analyses was to provide a basis for comparing the costs associated with each of the themes. In developing these base case life cycle cost analyses, reasonable estimates were utilized for facility throughputs, revenues, expenses, financing conditions and economic trends.

As the above indicates, it was necessary to make several assumptions in developing the alternative themes for solid waste management as well as the economic analysis of these themes. Therefore, it is important that these cost analyses not be construed as the actual costs for these programs, but rather serve as a basis for comparing these alternatives and determining which theme is most appropriate for implementation by the County.

As noted in Section 5.9.1, sewage sludge composting was conditionally identified as the recommended technology for that waste. To compare the cost of this recommendation with either the landfilling or the

incineration of sludge, a base case life cycle cost analysis was also performed for each of these sludge disposal options for themes 2, 3 and 4.

The base case life cycle analyses for all the themes with the alternative sewage sludge disposal technologies is presented in Table 5-23.

TABLE 5-23

BASE CASE LIFE CYCLE COST SCENARIOS

Theme	Sludge	Out-of County Waste	Range of Tipping Fees (1989 $) 1995	2014	(Act Yrs $) 1995	2014	Average Present Value Tipping Fee (1989 $)	(1995 $)
Landfill with Aggressive Recycling and Expanded Markets	C	No	$89	$67	$119	$227	84	113
Landfill with Aggressive Recycling and Existing Markets	LF	No	$67	$38	$90	$129	58	78
	C	No	$81	$47	$109	$159	69	92
	I	No	$88	$52	$118	$176	74	99
WTE Minimization	LF	No	$99	$52	$133	$176	80	107
	C	No	$116	$72	$155	$244	94	126
	I	No	$122	$69	$163	$234	99	133
Integrated Approach	LF	Low	$95	$63	$127	$213	79	106
	C	Low	$106	$72	$142	$244	88	118
	I	Low	$111	$76	$149	$257	92	123
Landuse/Landfill Minimization	C	Moderate	$101	$68	$135	$230	84	113
	I	Moderate	$106	$74	$142	$251	88	118

5.9.4 SENSITIVITY ANALYSES

In addition to the base case life cycle cost analysis performed for each theme, a series of sensitivity analyses were also performed for each theme to examine how variations in certain assumptions would effect the economic comparison of the themes. The following provides a brief description of the approach used in these sensitivity analyses.

Description of Sensitivity Analyses - The assumptions utilized in the base case analyses reflected estimates of the potential costs, economic trends and financing conditions. However, the forecasting of such factors included a significant element of uncertainty. Therefore, to demonstrate the economic impact of variations in these assumptions, estimates and projections, sensitivity analyses were performed by varying one or more of the following factors:

- Operation and maintenance costs escalated at higher rate
- Operation and maintenance costs escalated at lower rate
- Higher and lower energy rate (¢/kwh)
- Higher and lower net energy output (kwh/ton) for WTE facility
- No out-of-County waste supplied to WTE facility
- Change in the landfill height size
- Changes in the goal of percent recycled.

All other assumptions were the same as those used in developing the projected results for the base case.

A brief description of each sensitivity analysis that was performed for each base case analysis follows.

Sensitivity Analysis A, operation and maintenance costs escalated at higher rate - Assumed that the average annual inflation rate for operation and maintenance costs will be 8% throughout the term of the project.

Sensitivity Analysis B, operation and maintenance costs escalated at lower rate - Assumed that the average annual inflation rate for operation and maintenance costs will be 3% throughout the term of the project.

Sensitivity Analysis C, higher energy - The base case analysis was developed assuming:

- An avoided cost payment rate by Central Hudson Gas & Electric (CHG&E) of 5¢ per kwh in 1994 dollars and escalating at an average annual rate of 3%.

- WTE gross recovery rate of 500 kwh/ton before in-house use of 10% or 50 kwh/ton. Any electricity generated in excess of in-house consumption is assumed to be available for sale to CHG&E.

It is possible, however, that payment rates could increase at the same rate as inflation or better. Therefore, Sensitivity Analysis C considered a payment rate based on electric rate projections from Central Hudson Gas & Electric Company contained in Table 5-24. Additionally, Sensitivity Analysis C assumed the WTE

TABLE 5-24

EFFECTIVE AVOIDED COST

YEAR	ELECTRIC ENERGY PRICE (1) C/KWH
1990	3.78
1991	3.93
1992	4.53
1993	5.04
1994	5.75
1995	6.44
1996	7.97
1997	8.31
1998	8.67
1999	9.06
2000	9.46
2001	9.86
2002	10.29
2003	10.75
2004	11.22
2005	11.71
2006	12.22
2007	12.76
2008	13.32
2009	13.89
2010	14.34
2011	14.78
2012	15.19
2013	15.82
2014	16.35
2015	16.95

NOTE (1) The S.C. 10 transmission sevice level effective rates for Central Hudson Gas & Electric through the year 2008 as filed in NYPSC opinion 88.13. The estimated values of electric energy price in cents per kilowatt hou for the years 2010-2015 inclusive have been approximated by extrapolation of data.

facility will generate 555 kwh/ton of electricity before in-house use of 10% or 55 kwh/ton. Any electricity generated in excess of in-house consumption was assumed to be available for sale to CHG&E.

Sensitivity Analysis D, lower energy - As discussed in Sensitivity Analysis C, the base case analysis assumed:

- An avoided cost payment rate by CHG&E of 5¢ per kwh in 1994 dollars and escalates at an average annual rate of 3%.

- WTE recovery rate of 500 kwh/ton before in-house use of 10% or 50 kwh/ton. Any electricity generated in excess of in-house consumption is assumed to be available for sale to CHG&E.

In order to consider the situation in which energy prices drop which in turn affects CHG&E's payment rate, Sensitivity Analysis D was performed. This analysis assumed a payment rate of 3¢ per kwh in 1994 dollars and escalated at an average annual rate of 3%. Additionally, this analysis assumes the WTE facility will generate 445 kwh/ton of electricity before in-house use of 10% or 45 kwh/ton. Any electricity generated in excess of in-house consumption was assumed to be available for sale to CHG&E.

Sensitivity Analysis E, no out-of-County waste - The base case analysis for Themes 4 and 5 assumed that the WTE facility will accept out-of-County processible waste in order to perform at an 80% annual availability. It is possible, however, that the WTE facility would not be able to obtain a sufficient amount of out-of-County waste to operate the facility at 80% annual availability. Therefore, Sensitivity Analysis E considered the effect of zero out-of-County processible waste.

Sensitivity Analysis F, greater landfill depth - For base case analysis, the average landfill depth was assumed to be 60 feet. However, Sensitivity Analysis F considered the situation in which the average landfill depth was increased to 75 feet to minimize land use.

Sensitivity Analysis G, decreased landfill depth - For base case analysis, the average landfill depth was assumed to be 60 feet. Sensitivity Analysis G considered the situation in which the average landfill depth is decreased to 50 feet to reduce visibility of the landfill. However, the decrease in landfill depth resulted in an increase of landfill acreage.

Sensitivity Analysis H, maximization of recycling - For base case analysis, Theme 1 assumed maximized recycling of the County's waste stream by 1997 based on an assumption of expanded recycling markets. Themes 2, 3, 4 and 5 all assume a goal of 40% recycling of the County's waste stream by 1997.

For Sensitivity Analysis H, the assumption of expanded recycling markets was incorporated, even though the technology component of each theme, either a landfill, or a waste-to-energy facility and a landfill, are sized according to base case assumptions described in Section 5.9.2.

Sensitivity Analysis I, goal of 30% recycling - Sensitivity Analysis I, assumed a goal of 30% recycling of the County's waste stream by 1997, even though the technology component of each theme, either a landfill or a waste-to-energy facility and a landfill are sized according to base case assumptions described in Section 5.9.2.

Summary

Table 5-25 summarizes the results of the sensitivity analyses.

A summary of the range of projected disposal costs for each of the five themes considered in the economic analysis is presented in Figure 5-3. This figure summarizes the information presented in Figures 5-4 through 5-9. As these figures illustrate, the life cycle cost for Theme 2: Landfill/Recycle with Existing Markets is significantly less than the other alternative themes considered in this analysis.

5.9.5 CONCLUSIONS AND RECOMMENDATIONS

The evaluation of technologies to address the disposal of the resultant waste (i.e., that solid waste that remains after waste reduction and recycling programs) resulted in the identification of landfill and mass combustion field erected waste-to-energy as the preferred technologies for analysis in Phase 4. In Phase 4, the economic analyses of five alternative themes, which involved various combinations of landfill and/or waste-to-energy facilities with recycling programs, were reviewed to

TABLE 5-25

SENSITIVITY ANALYSIS
Life Cycle Cost Scenarios
Net Cost for Solid Waste Disposal Alternatives

Average Present Value Net Disposal Cost in 1995 Dollars

Theme	Base Case	Sensitivity Analysis								
		A	B	C	D	E	F	G	H	I
Landfill with Aggressive Recycling and Expanded Markets	113	147	98	113	113	113	110	115	113	103
Landfill with Aggressive Recycling and Existing Markets	92	130	78	92	92	92	88	111	104	90
WTE Minimization (400 tpd)	126	174	106	119	130	126	126	126	135	123
Integrated Approach (600 tpd)	118	162	99	109	123	130	118	118	111	122
Landuse/Landfill Minimization (800 tpd)	113	138	102	103	118	145	113	113	109	115

NOTE: Base case number is repeated if sensitivity analysis has no effect

FIGURE 5-3
SUMMARY OF ECONOMIC ANALYSIS OF SOLID WASTE DISPOSAL ALTERNATIVES

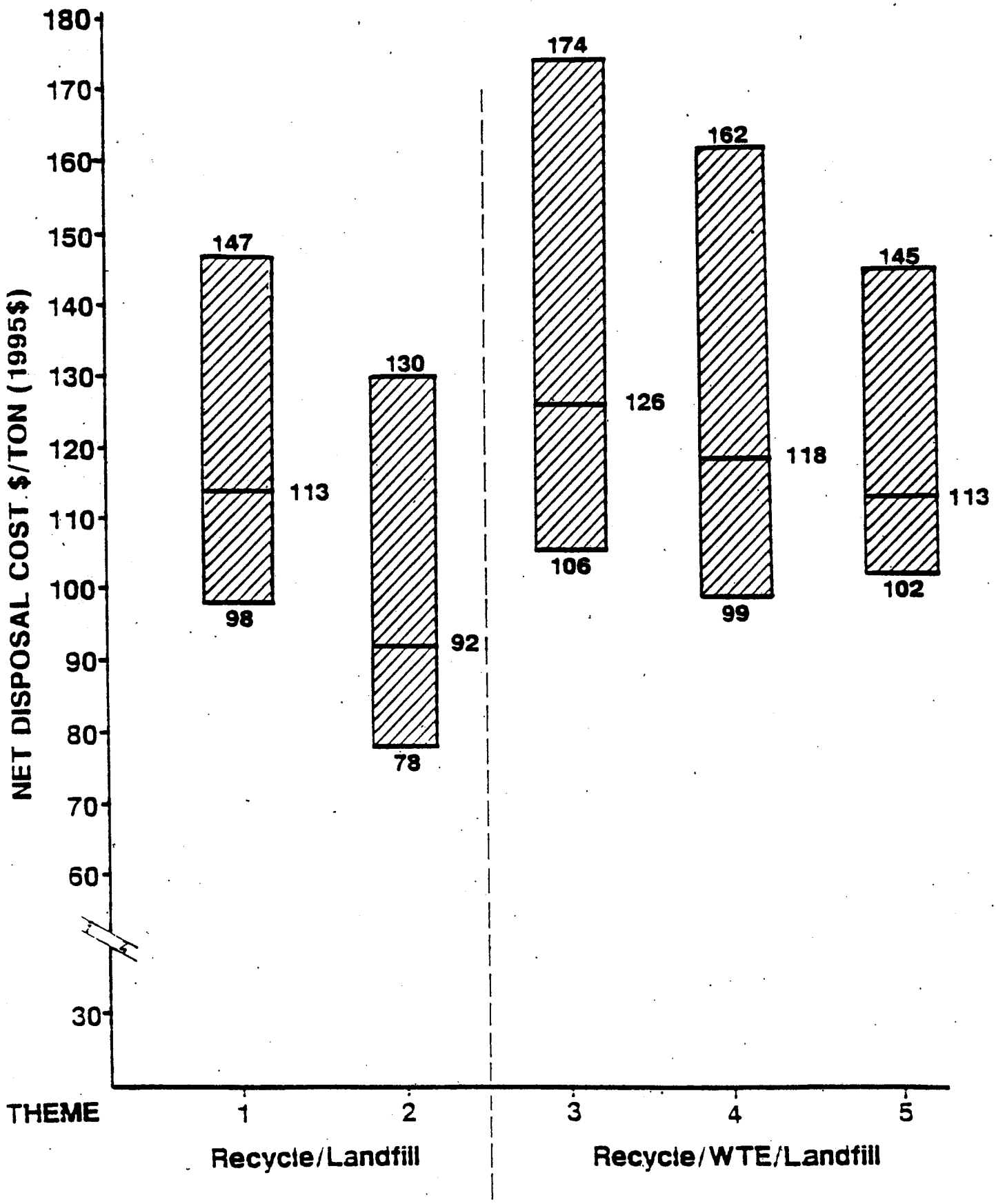


FIGURE 5-4
LIFE-CYCLE COST ANALYSES
THEME 1:LANDFILL/RECYCLING
WITH EXPANDED MARKETS

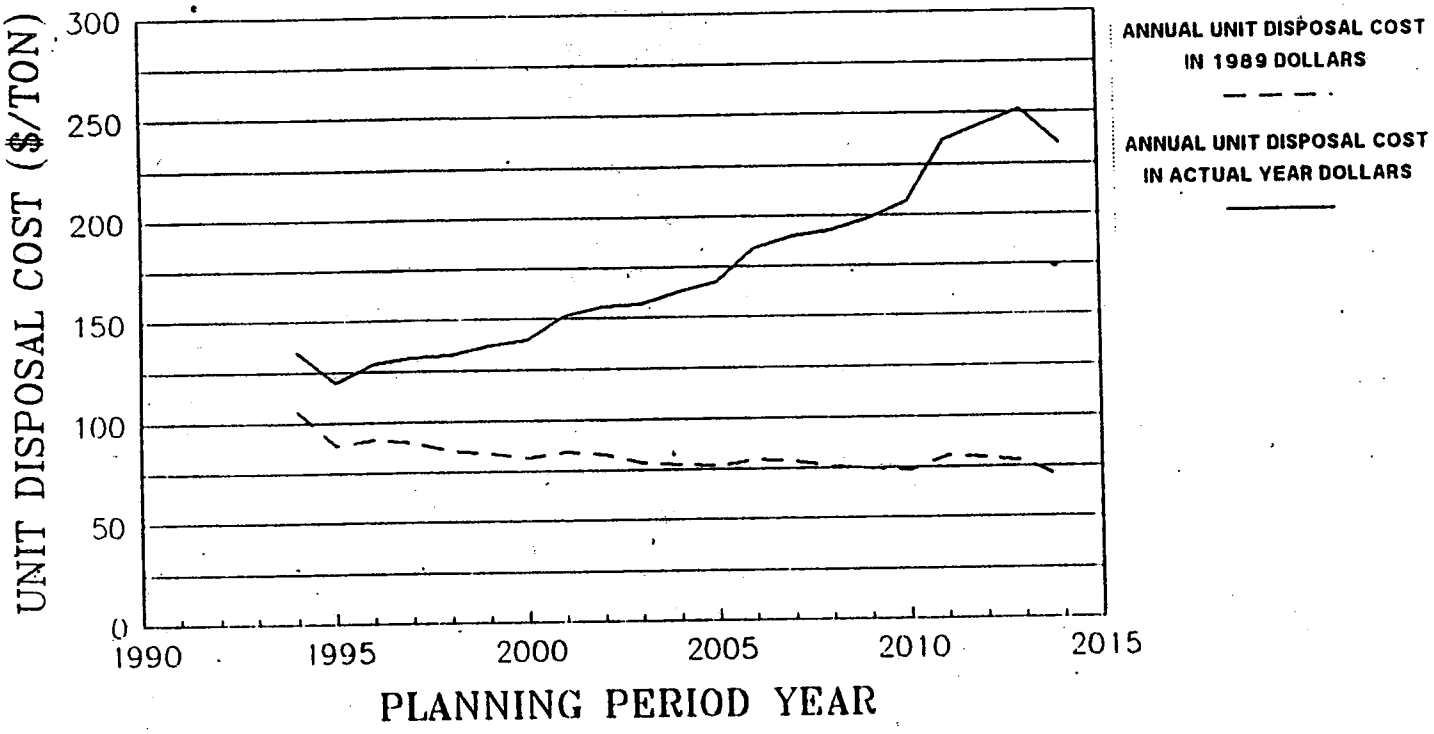


FIGURE 5-5
LIFE-CYCLE COST ANALYSES
THEME 2:LANDFILL/RECYCLING
WITH EXISTING MARKETS

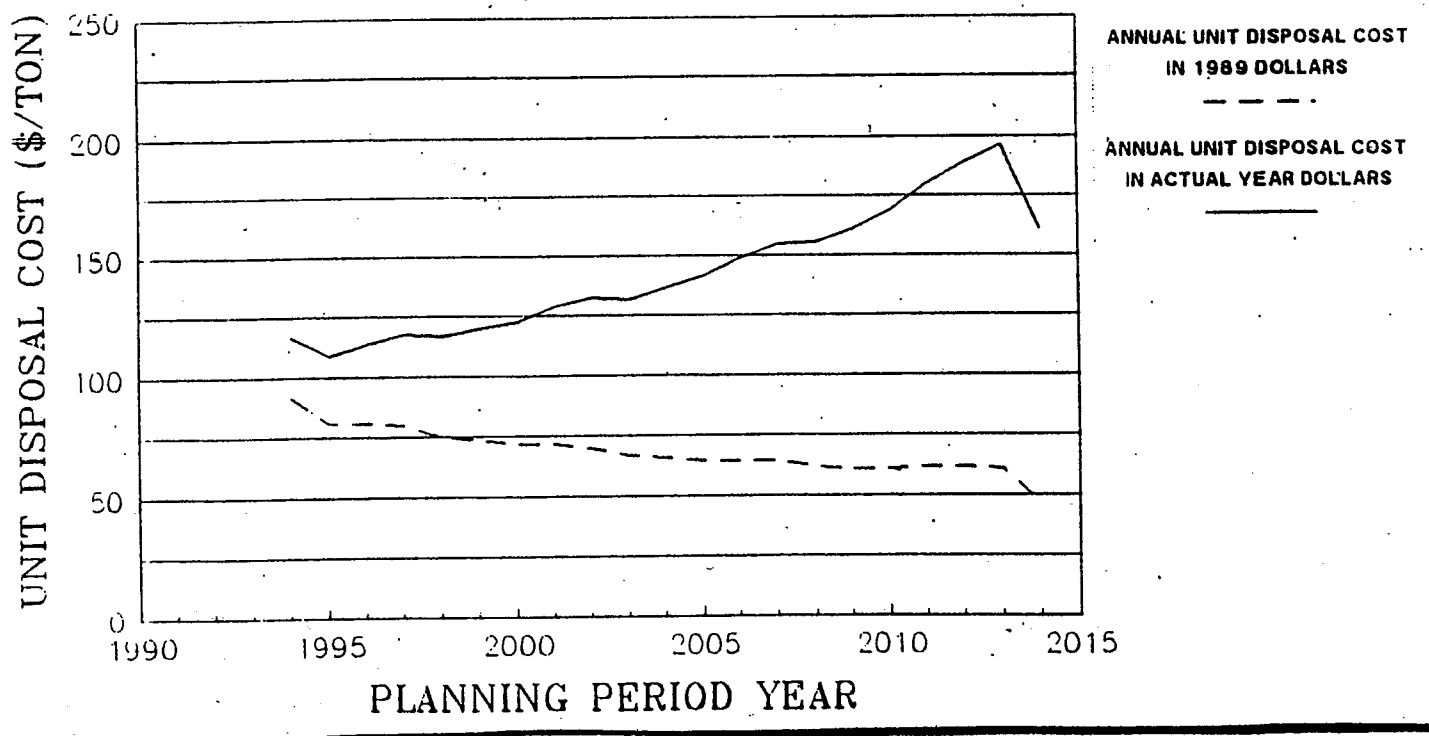


FIGURE 5-6
LIFE-CYCLE COST ANALYSES
THEME 3:WTE FACILITY MINIMIZATION

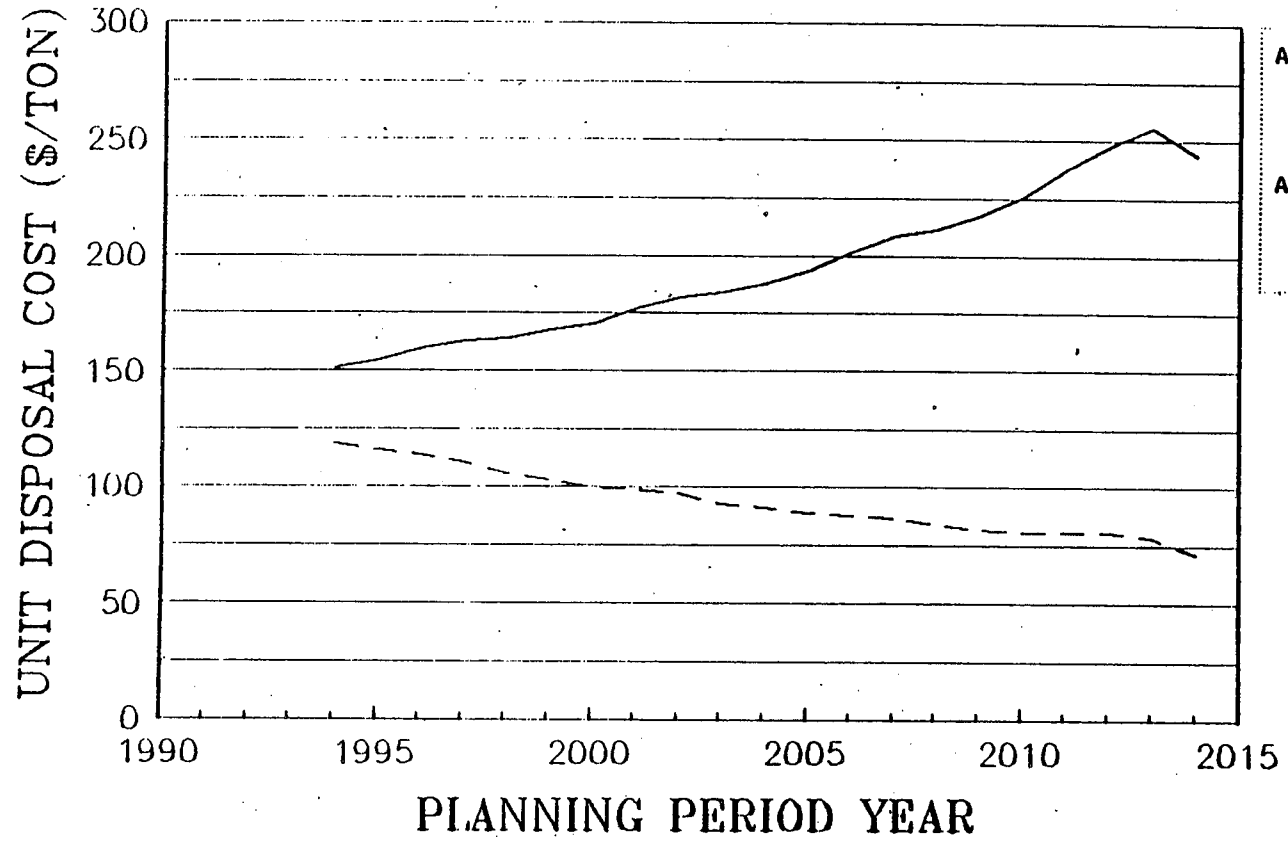


FIGURE 5-7

LIFE-CYCLE COST ANALYSES
THEME 4: INTEGRATED APPROACH

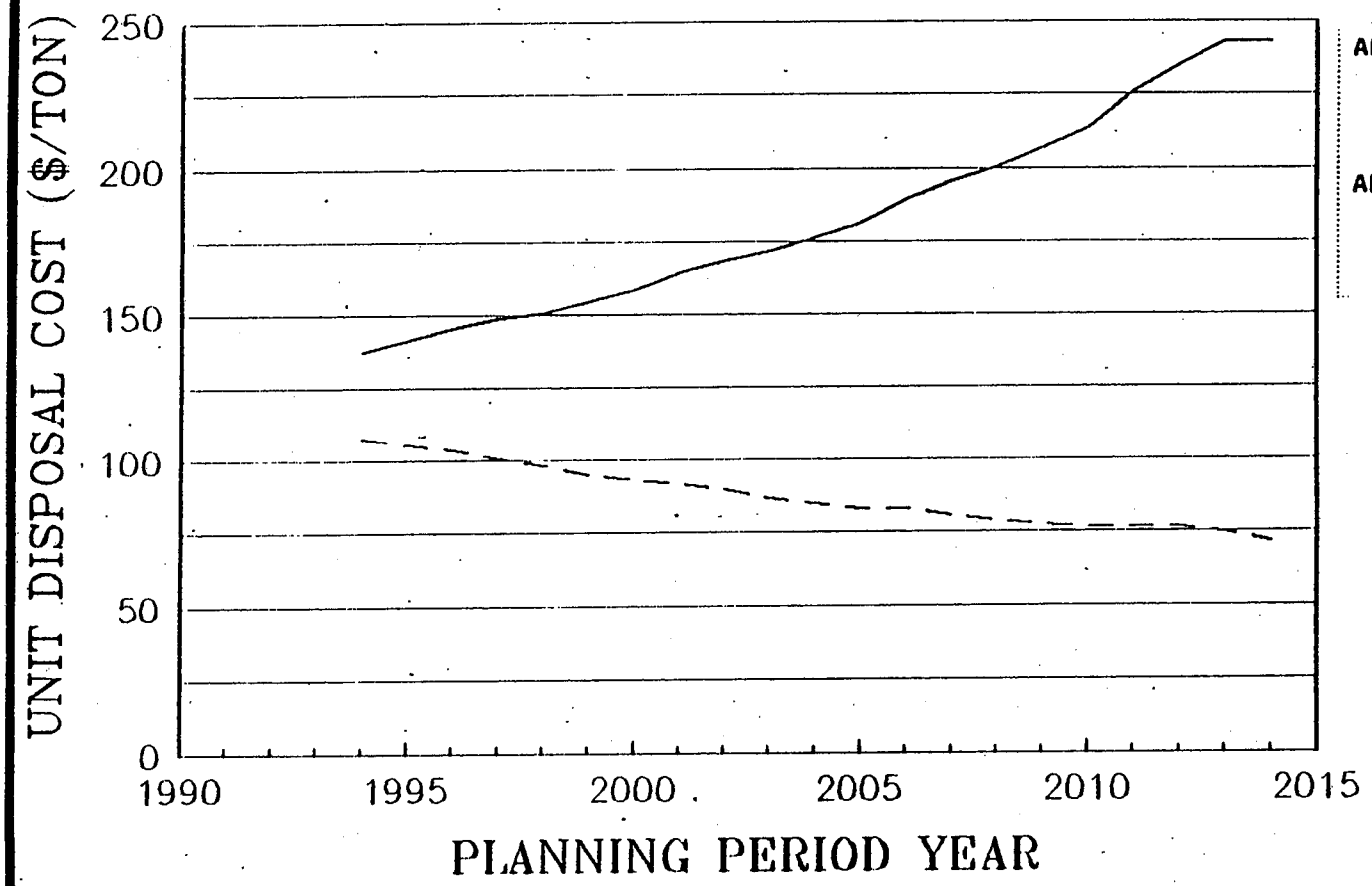


FIGURE 5-8
LIFE-CYCLE COST ANALYSES
THEME 5:LANDUSE/LANDFILL MINIMIZATION

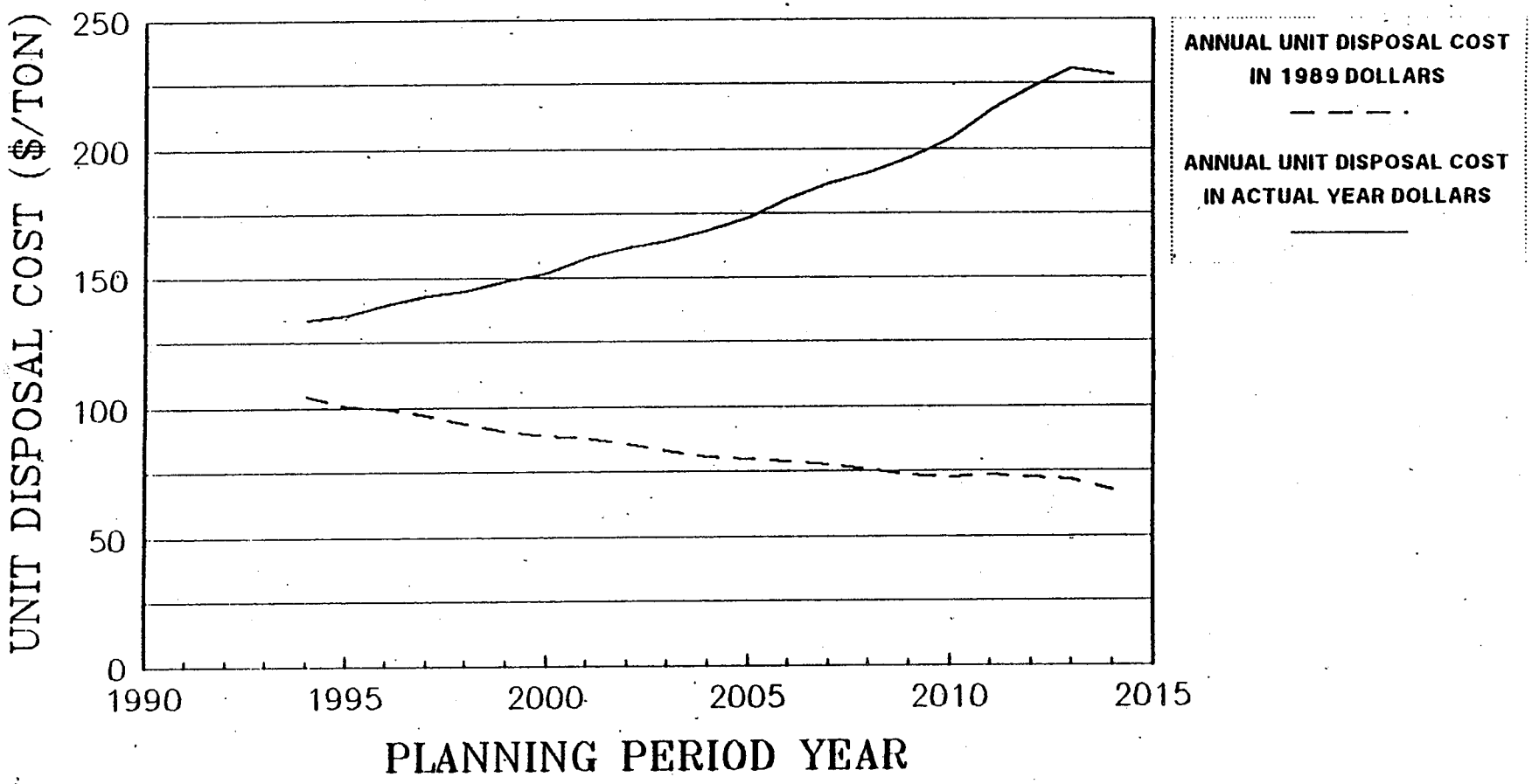
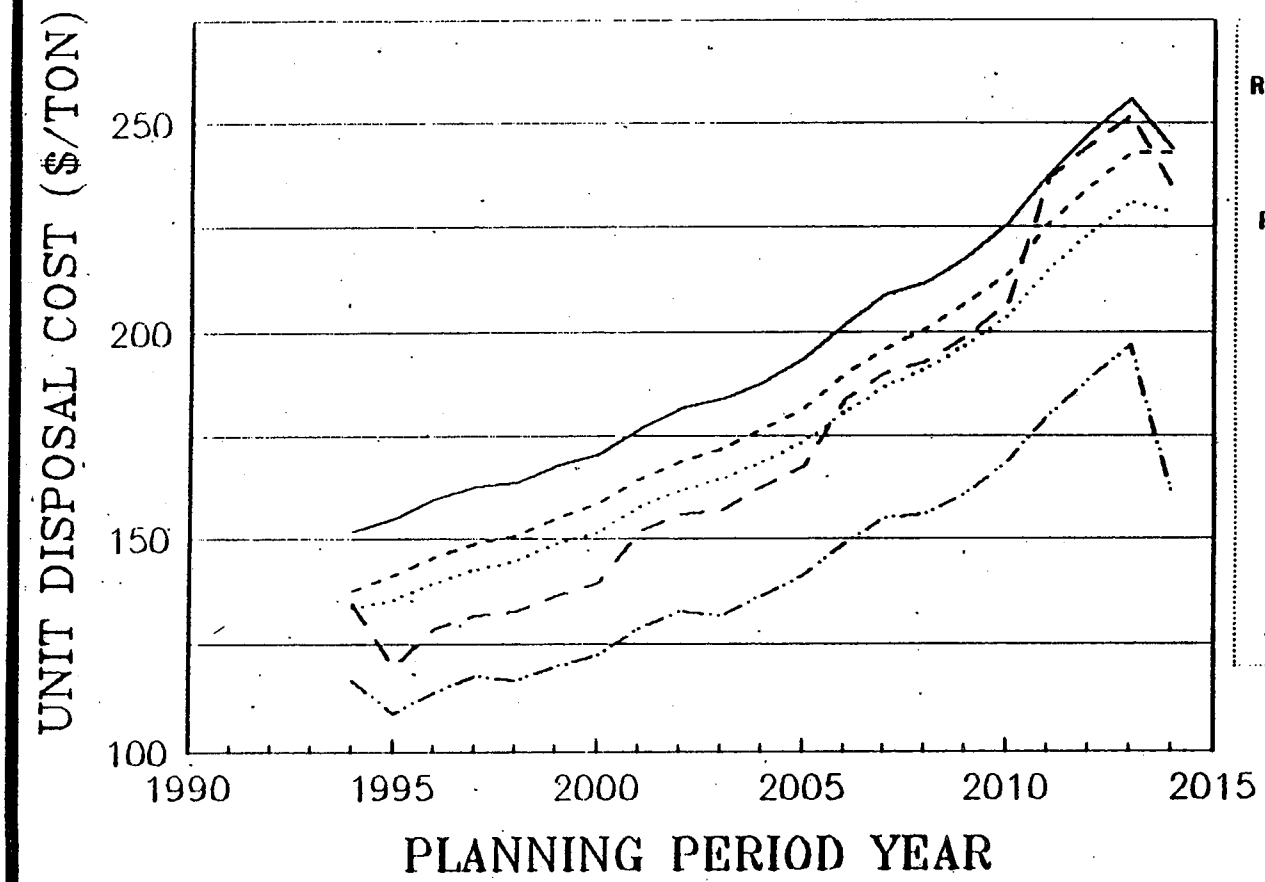


FIGURE 5-9
LIFE-CYCLE COST ANALYSES
COMPARISON OF THEMES



identify a recommended system for Ulster County. As the Phase 4 analysis indicates, the combination of landfill with recycling targeted to meet the state recycling goals offers life cycle costs that are significantly less than the life cycle costs associated with waste-to-energy alternatives. Based upon the life cycle cost analyses discussed above, the net disposal costs of Theme 2: Landfill/Recycling with Existing Markets, in terms of net present value, are lower than the waste-to-energy alternatives by approximately $20 to $35 per ton. It should be noted that development of recycling and landfilling would require an initial capital commitment that is significantly smaller than the capital commitment associated with the development of a waste-to-energy facility in conjunction with recycling and landfill facilities. This reduced capital commitment is reflected in the above described net disposal costs and results from lower capital costs and the phased construction of the landfill.

The above described economic analysis does not focus on the avoided costs that are associated with implementing a system of recycling and landfill. For example, by diverting waste through recycling or waste reduction, the costs associated with construction, operation, closure, and post closure monitoring of a landfill should be reduced. It should also be noted that, by not developing a Waste-to-Energy facility, the costs associated with such a facility are avoided. In addition to these avoided costs, some impacts may also be avoided (such as reduced usage of virgin materials, and a reduction in amount of material landfilled and/or incinerated). These avoided costs and impacts serve to reinforce the recommendation for Ulster County to use a combination of aggressive recycling and landfilling.

In addition to the potential economic impacts, there are several other issues which support the technology recommendation of landfill with aggressive recycling. Specifically, the issues of program flexibility, the lack of Countywide solid waste management and the associated infrastructure; and the potential impact of recycling are discussed in the following paragraphs.

The landfill with recycling alternative provides the County with significant flexibility to accommodate variations in solid waste types and quantities. This flexibility is provided through a phased landfill development approach and by having the ability to modify the recycling program, if necessary, to address variations in the solid waste stream.

There has been no Countywide management of solid waste in Ulster County. As a result, there is no existing framework or infrastructure in place that can be utilized as a basis to expand or develop a Countywide solid waste management program. The various parties who will be involved (i.e., municipalities, public, haulers, UCRRA and County) have not yet developed fully the working relationships or the contractual relationships that will be necessary to conduct such a program. Phased implementation of recycling programs coupled with phased landfill development provides the opportunity for these relationships to be developed over a reasonable period of time.

The impact of recycling on the waste stream has not been fully established, since implementation of the recycling program will be phased over several years. The technology recommendation includes an aggressive recycling program targeted at maximizing recycling. The full impact of the program can not be accurately assessed at this time. In addition, because solid waste in Ulster County has historically been disposed of in local municipal landfills which, in general, are not equipped with weigh scaled, data on the County's solid waste stream is limited. The combination of these two factors significantly complicates the sizing of a disposal facility to meet the needs of Ulster County. The implementation of a landfill offers greater flexibility in addressing these issues than does a waste-to-energy facility. Construction of a landfill is typically performed in phases and as a result the capital commitment to the facility is also phased over time and can be modified to address changes in the program.

These above factors, in combination with the life cycle cost analysis, result in the identification of landfill technology in combination with an aggressive recycling program as the recommended technology approach for Ulster County. It is further recommended that as the county-wide program is implemented, the County should maintain sufficient flexibility in critical program elements, such as site selection, and allowing for potential changes in legislative, regulatory or economic conditions which could result in the decision to utilize other technologies, such as composting. Another benefit of maintaining such flexibility is the ability to provide for use of innovative/alternative technologies without jeopardizing the County's ability to effectively manage the processing and disposal of its solid waste. For example, in addition to the implementation of the landfill/recycling programs, the County may request private vendor proposals for the development of alternative processing facilities. With the

landfill/recycling programs in place, this type of a facility could benefit the County by extending the life of the new landfill beyond the planning period. Alternatively, there may be minimal risk to the County, since the official request for proposals and subsequent contract(s) can be structured to require the private vendor(s) to dismantle the facility, clear and restore the site to its original condition at the expense of the private vendor should the operation of the innovative/alternative technology facility prove unsuccessful.

6.0 LANDFILL TECHNOLOGY OPTIONS

6.0 LANDFILL TECHNOLOGY OPTIONS

6.1 INTRODUCTION

In 1989, after public comments on the Draft GEIS for the Ulster County solid waste management program, UCRRA authorized its consultant, Malcolm Pirnie, Inc., to undertake additional studies on certain subjects. These additional studies were authorized because the subject matter either (a) was studied but not discussed in the Draft GEIS, (b) was not discussed in sufficient detail in the Draft GEIS, or (c) concerned a request that supplemental work be done to confirm the results of the siting study contained in the Draft GEIS. Specifically, the following issues were subjected to additional study:

1. Confirmation of siting study results presented in the Draft GEIS.

2. Transportation study to assist in determining the economic impact of multiple landfill sites as an alternative to a single landfill site.

3. A review of existing municipal landfill sites to determine whether or not those locations could be used as an alternative to the construction of a new landfill for the solid waste management program.

4. A study of landfill reclamation technology as an alternative to constructing new landfill facilities.

After the above work was authorized, UCRRA and its staff and consultants continued to meet with NYSDEC and County officials to confirm the extent of the work and procedure for its release and public consideration. Certain preliminary conclusions were released publically in December of 1989. The balance of the work was completed in draft form by Malcolm Pirnie, Inc. in March, 1990 and drafts of the work were provided to UCRRA at that time. Public presentations were made on March 8, 1990 and March 15, 1990.

Based on the above, UCRRA determined to treat this additional work as a supplemental draft GEIS ("SDGEIS"). This option was taken even though SEQRA regulations do not require that the additional studies be treated as an SDGEIS (see 6 NYCRR 617.3(k) (2) and 6 NYCRR 617.8(g)). UCRRA's determination was based on the belief that by issuing the additional studies in a SDGEIS, public review and comment would be maximized and the Agency would be required to respond officially and formally to the public comments. UCRRA further determined to hold a public hearing on the SDGEIS for the purpose of ensuring the greatest amount of public comment possible.

The matters studied in the SDGEIS do not constitute a new "action", as that term is defined in SEQRA, but are a further elaboration of issues relevant to the action studied in the Draft GEIS. Thus, the SDGEIS should be read along with the underlying Draft GEIS and frequent references are made in the SDGEIS to the underlying Draft GEIS. Since SEQRA procedures leading up to the issuance of the SDGEIS have already been completed and apply to the SDGEIS, it was necessary only for UCRRA to formally authorize the SDGEIS, receive, review, and determine its completion and issue notices of completion, circulate the SDGEIS and hold a public hearing.

6.2 SUMMARY

The results of the additional studies performed by Malcolm Pirnie, Inc. and set forth in this SDGEIS can be summarized as follows:

Supplemental Siting Analysis - The purpose of the Supplemental Siting Analysis was to ensure that the application of the criteria described in the Draft GEIS did not result in the exclusion of appropriate sites. For the purposes of this Plan, the Supplemental Siting Analysis identified 23 candidate areas in the County that could be developed for a landfill facility.

The Transportation Study - The purpose of the transportation study was to determine the impact of transportation cost savings by developing multiple sites within the County as opposed to siting facilities at one location. The result of the study, which compared a single site alternative in Saugerties with a two-mile alternative (one in Saugerties and one in the Town of Gardiner) with various transfer station scenarios, is

that the cost savings in transportation do not make the multiple site scenario more economic when taking into account the additional construction and operating costs incurred by developing multiple as opposed to single sites.

Use of Existing Landfill - An extensive study of existing landfills in Ulster County was undertaken in this work. The 15 operating municipal landfills in Ulster County were studied to determine if sufficient acreage would be available for the construction of new landfills and recycling and composting operations. It was determined that sufficient acreage could be made available at the Gardiner and New Paltz landfill sites for construction of new landfills, and that potentially suitable acreage for recycling and composting could be available at the Esopus landfill site. However, it was further recommended that development of facilities at these sites would not represent the most appropriate option for the County because site investigation programs for closure of the landfills have not yet been completed and there is potential of site contamination as these landfill facilities are unlined. Furthermore, because of existing site topography and constraints, the existing landfill footprints were not the most efficient, therefore resulting in landfill heights and footprint areas that would be greater than required at a new site. Steep slopes, mature woods,streams, near surface bedrock area, and groundwater at the existing sites would require more extensive site modifications than at a new properly sited facility. Finally, the capital cost to develop the existing landfill sites verses a single site were far greater, as was the annual operating cost. The study concludes that the most appropriate approach on both an environmental and economical basis would be for the County to develop a single landfill site.

(**Modification Added 8/92)

However, the Agency has reviewed the use of the most environmentally sound existing landfills during the interim period and until such time as the new, Countywide Part-360 landfill becomes operational. This use of up to three existing landfills under revised NYSDEC orders on consent would permit the Agency to manage the solid waste stream in a coordinated efficient, environmentally sound and economical manner during this period. Use of the existing landfills would be restricted to the existing footprint. No expansion would be allowed by NYSDEC, since sufficient capacity does not exist. Existing landfills not to be used will be closed pursuant to a Landfill Consolidation Plan to be developed by the Agency in consultation with NYSDEC and the County Health Department. The Agency could expedite closure by providing funds, raised through issuance of revenue bonds to assist municipalities in closing landfills.

Landfill Reclamation - Finally, the proposed technology of landfill reclamation through mining of existing municipal solid waste landfills was studied. The study concludes that landfill mining is an emerging technology which is not sufficiently developed at this point in time to be recommended as a long-term solid waste management alternative in Ulster County. Potential economic impacts, risks of operation, and the need for an alternative disposal site once non-recyclable materials are excavated from a landfill, lead to the conclusion that development of landfill reclamation as the main disposal technology for Ulster County is not feasible at this time.

Following is a summary of the results and conclusions that were drawn. For a detailed discussion of the analysis made on each option, the reader is referred to:

a) DGEIS, Volume II, Appendix C
b) DGEIS, Volume I, Section 7.4.5
c) Final DGEIS, Response Document, Section 3.6
d) Supplemental DGEIS, Sections 4.0 and 5.0
e) Supplemental DGEIS, Appendix B-E
f) Findings Statement, Sections 3.2 and 3.4

6.3 LANDFILL TECHNOLOGY OPTIONS

After the technology evaluation, which led to the recommendation of landfilling with aggressive recycling as the preferred solid waste disposal technology, and in response to public comments received during public hearings, UCRRA initiated a series of supplemental studies designed to determine which landfill technology would be the most environmentally sound and cost effective. Through these supplemental studies, UCRRA compared three options to each other:

- **Reclaiming Existing Landfills**
- **Use of Existing Landfills**
- **New Capacity Landfill(s)**

6.3.1 RECLAIMING EXISTING LANDFILLS

In response to public comment on this issue, UCRRA prepared a study on landfill reclamation. It was found that the technology for reclamation of existing landfills is in a developmental stage in certain parts of the United States and is in a research and development stage in New York State. Consequently, it is not presently available as a practical, economical, and environmentally sound means to expand capacity at existing landfills as a countywide solid waste disposal solution.

The study does not recommend landfill reclamation as long-

term solid waste management alternative for the County because of potential economic impacts, issues of leachate quantity and quality, the potential for encountering hazardous waste, the marketability of various mined materials and use of mined materials, and operating risks which could be substantial.

6.3.2 USE OF EXISTING LANDFILLS

The use of existing landfills as an alternative to construction of a new landfill facility was assessed in the earlier technology evaluation and was found not to be a viable alternative. In response to public comment received during the public hearings, UCRRA initiated a more detailed supplemental study on this issue. Results of this study indicated that this alternative would not be an environmentally sound or economically viable option for the County for the following reasons:

- No one existing landfill in the County could be developed as an alternative to a new landfill since one or more of the following factors impacts each of the County's existing landfills:
  - They lack sufficient capacity to handle the problem on any one site;
  - They are not located on acceptable soils;
  - They have disclosed and undisclosed environmental problems;
  - Many are not strategically located within the County;
  - None meet existing siting or design requirements of 6 NYCRR Part 360 regulations; and
  - Many have access problems;
- All are under NYSDEC consent orders to close or upgrade. The existing landfills are under consent orders of the NYSDEC to close or be upgraded to comply with 6 NYCRR Part 360 regulations. Testing to determine which alternative will be undertaken by the community is currently underway at all sites. To date, no community has determined to upgrade any existing landfill, as the costs would be prohibitive;
- Site investigation programs for the NYSDEC have not been completed for these sites, therefore the potential for existing site contamination has not yet been established nor the potential effect of contamination on acreage available for further development;

- o Reflecting uneven site topography and constraints imposed by the existing site boundaries, the resultant landfill footprints would not be the most efficient. Therefore, landfill heights and footprint areas would appear to be greater than those required at new sites;

- o Due to steep slopes, mature woods, streams, and near-surface bedrock and groundwater, the existing sites would require more extensive site modifications prior to development than the generic type sites;

- o The projected capital cost to develop the existing landfill sites vs. a single, generic site ($102.7 million vs. $98.1 million under Scenario 2, See Supplemental Draft GEIS, Appendix A), indicates that use of the existing sites represents a much more capital intensive option than utilizing a single, generic site. Furthermore, the annual operations and maintenance landfill(s) cost estimate for the existing sites vs. a single, generic site ($2.5 million vs. $1.6 million under Scenario 1 and $2.7 million vs $1.7 million under Scenario 2, See Supplemental Draft GEIS, Appendix A), also indicates that utilizing the existing operating landfill sites would be a more capital intensive option, based on operating requirements.

It was also found that sufficient acreage could be made available only if the existing Gardiner and New Paltz landfill sites could be used together for construction of new landfills, and the existing Esopus landfill site could be used for recycling and composting facilities. It was recommended that these sites would not represent the most appropriate option for the County because of:

- The potential of site contamination at the unlined landfill facilities;

- Poor existing site topography and constraints;

- Inefficient existing landfill footprints requiring greater landfill heights and footprint areas;

- Steep slopes, mature woods, streams and near surface bedrock and groundwater at the existing sites;

- Greater capital costs to develop existing landfill sites vs. a properly sited single site; and

- Greater operating costs than a single landfill.
  (See Supplemental Draft GEIS, pages 4-17 and 4-18)

Furthermore, the two landfills (Gardiner and New Paltz) that could provide sufficient capacity together, even with the

above constraints, are located in close proximity to each other, and the Gardiner landfill has very poor access. Opposition to the use of Gardiner landfill site clearly indicates that proposals to use existing landfills (or areas adjacent to them) will also engender significant public controversy. Therefore, no savings in legal or permitting costs is likely if the existing landfill alternative was pursued.

(**Modification Added 8/92)

While use of existing landfills is not feasible for the long-term solid waste disposal solution, selection of the most environmentally sound landfills would provide temporary disposal capacity during interim period while the Agency is designing, permitting, siting, and constructing the single Countywide Part-360 landfill.

By implementing a Landfill Consolidation Plan and operating three existing municipal landfills, the Agency would be able to provide sufficient disposal capacity for a period of 3-5 years. These consolidation landfills would be selected after analysis in the Landfill Consolidation Plan. Agreements would be negotiated with the municipalities which presently own them, and the Agency would enter into revised NYSDEC consent orders to operate and close the facilities.

The remaining landfills would be closed under existing Orders on Consent in an orderly fashion and solid waste from those municipalities would be sent to the Consolidation Landfills most convenient to the municipality. A Landfill Closure Assistance Program would be developed and funded to assist municipalities in closing existing facilities and, hopefully, would expedite closure.

When the single, new Countywide Part-360 landfill is operational, the Consolidation Landfills would be closed.

6.4 SINGLE VS. MULTIPLE LANDFILLS

Initially, UCRRA considered co-locating all of its solid waste management facilities (i.e. Recycling center, composting site, and landfill site, etc.) at one location. UCRRA is no longer considering the co-location of all facilities in one place and has begun a program of diversification, (for example):

- Two recycling centers - one in the Town of New Paltz and one in the City of Kingston are being considered;
- Each municipality is developing local Municipal Recycling Drop-Off Sites (MRDS);
- Each municipality has been asked to establish a local yard waste composting site;
- A system of garbage transfer stations around the County are to be established; and

- Private sector C&D recycling and Municipal Solid Waste Composting facilities are being considered.

UCRRA maintains that only a single Part 360 State-of-the-Art landfill is needed. The advantages and disadvantages of a single landfill 100 acres in size vs. multiple smaller landfills were identified and evaluated. (See Table 6-1 below.) Also, in response to public comment, UCRRA conducted a study of economic impacts of developing multiple landfill sites vs. a single site. For a detailed discussion of the advantages and disadvantages of a single landfill compared to multiple landfills, the reader is referred to:

a) DGEIS, Volume I, Section 7.0
b) Final Response Document, Section 3.7
c) Supplemental DGEIS, Section 3.0
d) Supplemental DGEIS, Appendices A-E
e) Supplemental Response Document, Section 3.0

The purpose of the economic impact study was to determine whether or not it was cheaper to develop multiple landfill sites because of perceived savings in transportation costs. The study concluded that the estimated total disposal costs (capital, operations, and maintenance) for a single landfill site were far less than that of multiple sites despite some savings in transportation costs.

When the advantages and disadvantages were evaluated in conjunction with State policy, which calls for the closing of landfills which are polluting the environment and replacing them with state-of-the-art landfills where necessary, it was recommended that a single landfill facility properly sited, designed, engineered, and located near an adequate transportation network is the most environmentally sound and economic disposal alternative for the County.

TABLE 6 - 1

SINGLE VS MULTIPLE LANDFILLS

LANDFILL	ADVANTAGES	DISADVANTAGES
SINGLE NEW CAPACITY	- Less complicateand less expensive environmental assessment/permitting procedure; - Less overall acreage required; - More efficient control of operations and management of the facility; - Duplications of facilities (ie. scales, hours, bldg. roads, etc.) mechanical and operating equipment and services (maintenance, personnel, engineering, and design, etc.) are avoided	- Impacts of the single site landfill are borne by one host community.
MULTIPLE NEW CAPACITY	- The impacts associated with the solid waste mgt. facilities are distributed over a number of communities rather than having one host community; - Increase flexibility to address a significant operating problem or hazard; - Reduced transportation costs.	- Increases costs & level of effort necessary to complete multiple siting & permitting procedures; - Multiple design, procurement, & construction requirements; - More costly operating & mgt. requirements since operations would be dispersed among several sites; - Additional costs to develop support systems such as scales, roadways, buffer zones, utilities, administration facilities, & parking on each of several sites resulting in greater expenditure & greater use of land; - Increases costs in closing & monitoring closure of multiple sites; - Increased capacity requirements because of the inability to take advantage of the geometry of one larger site as opposed to several smaller sites; - Decreased ability to phase in landfill development because of reduced capacity at the multiple sites.

7.0 IMPLEMENTATION ALTERNATIVES AND APPROACHES

7.0 IMPLEMENTATION ALTERNATIVES AND APPROACHES

7.1 INTRODUCTION

Other sections of this document have focused on various technical studies necessary for the development of the Solid Waste Management Plan for the County. These included: waste characterization studies, comprehensive recycling analysis, evaluating technology alternatives, and identifying appropriate sites. This chapter discusses the institutional issues that must be addressed to implement the preferred approach and assesses the following:

- **Solid waste stream flow control**
- **Facility procurement**
- **Facility ownership**
- **Host community program**
- **Financing and funding assistance.**

A discussion of these issues along with an overview of related legal matters and the allocation of risks is presented below.

7.2 SOLID WASTE STREAM FLOW CONTROL

A county developing a solid waste facility must be assured that the solid waste within its jurisdiction will be delivered to the facility. This is referred to as solid waste stream flow control ("flow control").

Three methods of solid waste stream flow control have been successfully used at waste disposal facilities in the U.S. (often in combination with one another):

- **Contractual methods**
- **Legislative methods**
- **Economic methods**

The following sub-sections discuss these methods and the advantages and disadvantages of each.

7.2.1 CONTRACTUAL METHODS

The simplest method of controlling the flow of solid waste is to have the owner of a waste disposal facility contract directly with the haulers collecting the solid waste or with the municipalities within which the solid waste is generated. This method of voluntary contractual commitments has normally been quite effective to ensure a sufficient solid waste stream flow to a facility. An important issue to consider when using this method is

that contracts with private haulers generally are not considered adequate controls by the financing community (bond underwriters, potential bond purchasers). Therefore, if some form of revenue bond financing is utilized, it would probably be necessary to contract with the municipalities or the County as well, to ensure that solid waste is delivered to the facility.

Important provisions in such a contract might include:

- Specification of the tipping fee charged delivering solid waste to the facility;

- Escalation provisions for the tipping fee over the term of the contract;

- Commitment by the facility owner to accept a specified amount of solid waste; and

- Commitment to deliver a guaranteed waste quantity to the facility and to pay the specified tipping fees regardless of whether the guaranteed tonnage is actually delivered. This provision is commonly referred to as the "put-or-pay" agreement.

A typical contract term for this method of solid waste stream flow control is 20 to 25 years.

The primary advantage of using contractual methods for "flow control" is the ability to guarantee sufficient delivery of solid waste to a waste disposal facility over a long-term period. Another advantage is that contractual methods for "flow control" can foster cooperation among the citizens of the County, the private haulers serving them, and a waste disposal facility serving both.

A disadvantage of contractual methods for "flow control" is that contract negotiations can be lengthy and difficult depending upon the cooperation of the municipalities or private haulers and number of municipalities or private haulers involved in the negotiations.

Should the County seek to pursue contractual methods of solid waste stream flow control, the most effective approach may be to contract directly with the municipalities rather than with the private haulers. This alternative would require each municipality to control its own solid waste stream via ordinances (see Section 7.2.2) in order to fulfill long-term contract commitments made with the County.

A list of some solid waste disposal facilities that have utilized contractual methods of solid waste stream flow control is provided in Table 7-1.

7.2.2 LEGISLATIVE METHODS

Legislative methods for controlling the solid waste stream flow permit a municipal entity to enact a local law to direct municipal and/or private haulers to use a specified solid waste disposal facility. Local governments, (County, town, village, or city) would exercise legal or regulatory authority via laws and ordinances over the collection, transportation, and ultimate disposal of the solid waste generated within jurisdictional boundaries. The exercise of local government police power, especially when used to protect the public health and well-being of the community, takes precedence over property rights and has been upheld by courts.

The legality of legislative methods for solid waste stream flow control has been challenged in the past. Typical grounds cited for challenges include restraint of trade, interference with interstate commerce laws, and the sequestering of private property. The courts have upheld these legislative controls as long as they were adopted in accordance with a state policy that displaces competition with regulation by legislative action.

The primary advantage of using legislative methods for "flow control" is that they legally permit the municipality to control the flow of solid waste within its jurisdictional boundaries and to direct it to a waste disposal facility by force of law. In many cases, a combination of legislative and contractual measures are utilized to provide for better control of the solid waste stream. Another important advantage is that legislative methods can be implemented in conjunction with a municipal source separation and recycling program.

A disadvantage is the potential for legal challenges to the implementing of an ordinance, special taxing district, or other source of legislative control. Such legislation must also be drafted to show support for recycling activities and demonstrate that it will not interfere with implementation and operation of recycling programs.

A representative list of solid waste disposal facilities that have utilized legislative methods for solid waste stream flow control is provided in Table 7-2. As this table indicates, some form of legislative control of the waste stream has been used for many solid waste disposal facilities in New York State.

TABLE 7-1

FACILITIES HAVING CONTRACTUAL METHODS
OF SOLID WASTE STREAM FLOW CONTROL

Location	Solid Waste Disposal Technology	Design Capacity (tpd)	Year Operational
Niagara Falls, NY	RDF-to-Energy	2,000	1980
Albany (ANSWERS), NY	Material Recovery and RDF Production	750	1981
Glen Cove, NY	WTE with sludge co-disposal	225	1983
Westchester Co., NY	WTE	2,250	1984
Rome, NY	WTE	200	1985
Long Beach, NY	WTE	200	1988
Bridgeport, CT	WTE	2,250	1988

TABLE 7-2

FACILITIES HAVING LEGISLATIVE METHODS
OF SOLID WASTE STREAM FLOW CONTROL

Location	Solid Waste Disposal Technology	Design Capacity (tpd)	Year Operational
Babylon, NY	WTE	750	1989
Cuba, NY	WTE	120	1983
Hempstead, NY	WTE	2,320	1989
Islip, NY	WTE	520	1989 (projected)
Dutchess Co., NY	WTE	500	1987
Rochester (Monroe Co.), NY(1)	Material Recovery and RDF Protection	2,000	1979
Volney, NY	WTE	200	1986
Akron, OH	RDF-to-Energy	1,000	1979

Note: (1) Not operational.

7.2.3 ECONOMIC METHODS

Economic methods for controlling waste stream flow can be used to actually attract solid waste (i.e. setting artificially low tipping fees) to a disposal facility. The rationale is simple: that if the tipping fee charged is set low enough, the economic advantages of decreased cost and higher profit for the private haulers should attract the hauler to the facility. This economic advantage would cause the haulers to dispose of their waste at the County facility rather than another waste disposal site.

For example, at a Countywide landfill facility there could be a tipping fee for private haulers lower than that charged by present waste disposal facilities such as out-of-county or local non-complying landfills. In some instances, the tipping fee charged may be zero. This incentive generally can ensure that a sufficient supply of solid waste would be brought to the County landfill since the private haulers would have no financial reason to deliver it elsewhere.

Economic methods often require a willingness by the citizens within the municipal service area to subsidize waste disposal revenue not received due to the low tipping fees. Typically, this subsidy may be derived from a general fund, or ad valorem taxes. Or, it may be subsidized through taxes levied against the waste generators within the service area (i.e., a special taxing district). The primary advantage in using economic methods is that the need for enforcement to ensure the waste is delivered to the facility is minimal.

There are several disadvantages to using economic methods. Setting the appropriate tipping fee to ensure that sufficient waste arrives at the facility is difficult. Obtaining public support is also difficult since a tax increase or establishment of a special taxing district may be required.

7.2.4 SUMMARY OF SOLID WASTE STREAM FLOW CONTROL METHODS

As the above discussion indicates, there are advantages and disadvantages associated with each of these solid waste stream control methods. A summary of major issues to consider in the process of determining which method will be used to control the solid waste stream is presented in Table 7-3.

As part of implementing a Countywide solid waste management program, it will be necessary to institute some form of control over the solid waste stream to ensure that wastes are properly disposed of or recycled.

TABLE 7-3

SUMMARY OF SOLID WASTE STREAM FLOW CONTROL METHODS

Solid Waste Stream Flow Control	Description	Economic Considerations	Legal Considerations	Other Considerations
Contractual Methods	"Put-or-pay" contracts between collectors (municipal and/or private) and (1) implementing municipality or (2) facility operator.	Contracts with private haulers may not provide sufficient security to satisfy the the requirements of financial markets. Contracts with municipalities should be adequate security for revenue bonds.	Local enabling legislation may be required to permit municipalities to enter into long-term disposal contracts.	May involve protracted contract negotiations with numerous municipal and/or private participants. Requires early commitment by implementing municipality regarding costs and timing.
Economic Methods	Service is paid for all or in part by taxes or user fees not charged at the Facility; user charges (tipping fees) are set artificially low or at zero.	Acceptable security for revenue bonds.	None	Imports of waste from outside service area can be an issue.
Legistative Methods	Waste collectors are required by permit or ordinance to use the facility.	Acceptable security for revenue bonds.	Potential for legal challenges of ordinances.	Removes incentive for facility to compete with other alternatives. Export of waste out of service area can be an issue if less expensive disposal is available.

Issues to consider in selecting the method of control include the following:

- The County is largely rural in character with most urban development concentrated in the eastern portion of the County.

- Little to no control over the waste stream is currently exercised by the municipalities in the County. The primary exceptions are the City of Kingston, which has municipal collection of residential and some commercial waste, and the Town of Kingston, which it has bid out the collection of solid waste for the Town.

The combination of these two factors indicates that it may be a difficult and complicated process to get local municipal ordinances in place to control and direct the waste stream. Such ordinances would need to be consistent in their control measures while providing sufficient flexibility for recycling program requirements. It makes no sense to have each of the 24 local municipalities develop and enforce such ordinances. This would be inefficient, confusing, and counter-productive. The better alternative would be for the County to put in place a uniform County-wide waste control system. Therefore, it is recommended that the County Legislature enact a local law pursuant to the power granted in Section 2050-t(3) of the Public Authorities Law that will delegate authority to direct the solid waste stream to specific solid waste management facilities.

Since the financial community has typically required that the control of the waste stream include put-or-pay obligations as well as the legal authority to direct the waste to specific facilities, it is also recommended that a contract be negotiated between the County and the owner of the solid waste disposal facility, most likely the Resource Recovery Agency. Under contract, the County would guarantee that solid waste generated in the County will be disposed of at the Agency's facility and payments of the tipping fees will be made, and the Agency would guarantee the availability of the facility for disposal.

Thus, a combination of legislative and contractual waste stream control methods is recommended.

7.3 MANDATORY RECYCLING LAWS

There are no laws, rules, regulations, or ordinances in Ulster County which would prevent the implementation of the recyclables recovery program, or constrain or inhibit municipal programs. Alternative legislation will be

required to ensure a successful recycling program. Legislation providing for mandatory source separation and segregation of recyclables and reusable materials must be enacted by 1992 in accordance with the Solid Waste Management Act of 1988. Mandatory recycling laws or ordinances are intended to ensure that targeted recyclable and reusable materials are separated from the waste steam. A more detailed discussion of the County's Plan for enacting mandatory recycling legislation is provided in Chapter 9.0. It was recommended that in developing such legislation, provision be made not only for those materials that are presently being recycled or reused but also for adding materials in the future.

7.4 FACILITY PROCUREMENT

The purpose of this section is to provide an overview of the procurement methods by which a solid waste disposal facility can be implemented in New York State. A brief review of applicable New York State General Municipal Law regulations for the procurement of solid waste disposal facilities is also discussed in this section. There are four primary methods of procuring a solid waste management facility:

- **Conventional Architect/Engineer**
- **Turnkey**
- **Full Service with Private Ownership**
- **Full Service with Public Ownership**

7.4.1 CONVENTIONAL ARCHITECT/ENGINEER

From a historical perspective, the conventional architect/engineer (A/E) procurement method has been the most common approach used in public works projects. A municipal entity such as a city or county procures goods or services by requesting and receiving formal bids. Award of the contract or purchase order is then made to the lowest bidder. Typically, an architect/engineering firm prepares the design and bid documents. Contractors bid on the construction of the facility. Operation of the facility is performed by the municipal entity or another private contractor. The intent of the A/E approach is to ensure the lowest cost possible for the municipal entity and to prevent collusion in the award of the contract or purchase order. The A/E procurement method is required by law in many municipalities and may even be more detailed in the separation of services to be bid on. For instance, in New York State, Section 101 of

the General Municipal Law (the so-called "Wicks Law") requires that a municipality obtain separate contracts for public works projects involving a building, and costing more than $50,000.

Typically, legal constraints on this procurement method permit only very limited exchanges of information and modifications to specifications during the formal bidding process. As such, the contract documents including drawings and specifications must be detailed and thorough. The preparation of the bid package containing these contract documents is typically performed by a professional architect/engineer retained by the municipal entity. The contract documents produced by the A/E create the basis for the bid package which contractors use to submit proposals for construction of the waste disposal facility designed. The A/E procurement method typically involves the following sequence of events:

- Selection and engagement of a professional A/E by the municipal entity

- Planning and preparation of detailed engineering drawings and specification by the A/E for use in the bid package in accordance with the needs of the municipal entity

- Placement of advertisements for formal bids in public documents

- Receipt and recording of the formal contractor bids by the municipal entity

- Public opening of the formal contractor bids by the municipal entity

- Review by the A/E and the municipal entity of all recorded formal contractor bids for completeness, responsiveness, omissions, and arithmetical errors

- Identification of the lowest formal contractor bid that satisfies all bid package requirements

- Review and evaluation of the lowest bidding contractor for the capability to perform satisfactorily

- Award of the contract to the lowest bidding contractor satisfying all bidding requirements by the municipal entity.

Once the contract for construction has been awarded, the facility should be built in accordance with the schedule and for the price provided in the contract. The completed waste disposal facility would be owned by the

municipal entity and may be operated either by public sector employees or private sector employees under a separate operations contract.

The major advantage of the A/E approach is the level of control maintained by the municipal entity. In the design phase, the municipality with the architect/engineer develop specifications and drawings that identify in detail how the facility will be constructed by the contractor. In addition, the operation of the facility will be directly controlled by the public body either through municipal employee operation or through a contract with the private sector. Another advantage is that lower disposal costs might be realized since the municipality directly controls the costs and revenues and would not have to pay a turnkey or full-service vendor for taking the risks associated with design, construction, and operation of the facility.

The primary disadvantage of the A/E procurement method is that a significant amount of risk would be undertaken by the municipal entity. Typical risks include capital and/or operating cost overruns, failure to pass acceptance testing, failure of the facility or components therein to perform as specified, control of the solid waste stream flow, variations in the composition of the solid waste stream flow, invocation of force majeure clauses, and change in environmental and regulatory requirements. No single procurement method provides for the elimination of all of these risks; however, procurement methods other than the A/E type provide for a greater allocation of these risks to a contractor or full service vendor.

A representative list of solid waste processing facilities that have utilized the A/E procurement method is provided in Table 7-4. It should be noted that, in addition, most landfill disposal facilities are provided by using the A/E method.

It is interesting to note that the A/E procurement method has been modified as of late by some municipal entities in their procurement of solid waste facilities. This modified A/E procurement method seeks bids on the entire solid waste disposal system and facility in a single package, rather than bids on each individual piece of equipment, as is done in the conventional A/E procurement method. As an example, for a waste-to-energy disposal facility, the modified A/E procurement method is commonly referred to as a "chute-to-stack" procurement. The professional A/E is still responsible for designing the structural and ancillary features. Besides providing the benefits of a conventional A/E method as described previously, the modified A/E procurement method reduces the number of potential vendors that the municipal entity

must interact with, and as a result provides more evenly distributed risk allocation to the lowest bidding contractor awarded the work. This approach can also be employed in processing recycling facilities with the processing equipment replacing the "chute-to-stack" components. Under the A/E approach, each private sector entity is responsible for guaranteeing its portion of the work. If problems arise, delay will be blamed by the contractors on each other or the A/E designer. If an operational problem or equipment failure occurs then blame shifting will also occur. There is no one entity for the A/E procurement method which bears all of the design, construction and operating risks. Thus, resolution of problems generally involves extensive litigation, delay, cost overruns and possibly, project failure.

A representation list of recent solid waste disposal facilities that have utilized the modified A/E procurement method is provided in Table 7-5.

7.4.2 TURNKEY

In the turnkey procurement method, one contractor is responsible for the design, construction, start-up, and acceptance testing of a solid waste disposal facility. Under this procurement method, the turnkey contractor is responsible for both acquiring the needed equipment for the waste disposal facility and ensuring that the architectural and engineering design work is accomplished. Once the acceptance testing of the facility is successfully completed, the contractor has fulfilled its responsibilities and responsibility for operation of the waste disposal facility reverts to the municipal entity.

The turnkey procurement method often uses a negotiated contract procedure rather than a formal competitive bidding process as is done in the A/E procurement method. The main advantage in negotiating contracts is that there is an opportunity for the contractor and the municipal entity to modify and refine the project approach to best suit the needs of the municipality, while addressing the contractor's capabilities. The rigidity of the A/E procurement method does not permit this type of negotiation. In addition, a turnkey procurement method allows the municipality to consider qualitative aspects about the turnkey contractor (such as scheduling, project management, and cost control expertise).

A negotiated turnkey procurement typically involves a Request for Proposals (RFP) solicitation. This multiple step procedure incorporates components of both formal

bidding and competitive negotiation. The first step, the draft RFP, solicits comments from contractors interested in submitting proposals for a solid waste disposal facility and outlines the requirements that the respondents will have to meet to be responsive to the RFP. The second step, the final RFP, is a comprehensive document identifying the specific information to be contained in the vendor proposals. The RFP is usually advertised and requests the submission of technical proposals which are then evaluated by a selection committee. Parameters evaluated in the RFP step can include, but are not limited to, waste disposal facility capacity, siting, material and energy recovery (if applicable), performance specifications and guarantees, risk allocation, and acceptance testing. Thereafter, discussions are held with the proposers to determine the completeness of their responses and to allow them to make changes. These discussions are normally concluded when the municipality requests a best and final offer from each respondent by a specific cut-off date. Upon receipt of these offers, the municipality reviews and evaluates them. The proposer whose offer is most responsible and complete is subsequently awarded the turnkey contract.

Negotiated turnkey procurement in New York State is regulated by Section 120-w of the General Municipal Law. The procedure for a turnkey procurement method involves the following sequence of events:

- Preparation of the draft RFP by the municipal entity
- Publication of Notice for draft RFP issuance from the municipal entity
- Establishment of both a 60-day comment period and a 10-day comment evaluation period thereafter
- Preparation of the final RFP by the municipal entity
- Publication of Notice for final RFP issuance from the municipal entity
- Receipt and evaluation of the proposals by the municipal entity
- Negotiations between the proposers and the municipal entity
- Request and receipt of best and final offers
- Contract negotiations between the selected contractor and the municipal entity if necessary
- Award of the contract by the municipal entity.

The basic advantage of the turnkey procurement method over the A/E approach is that there is a more even allocation of risk between the municipality and the contractor. Since the contractor is a single entity, he is required to satisfy the acceptance testing protocol and meet performance guarantees. Additionally, the turnkey procurement method makes the contractor responsible for design and construction cost overruns, thus reducing this risk to the municipality. In the extreme event that the waste disposal facility does not meet acceptance testing requirements or performance guarantees, the municipal entity has the choice of either not accepting the facility or requiring the contractor to modify the facility to conform with the requirements and guarantees included in the contract.

Disadvantages of the turnkey procurement method include both the significant amount of risk undertaken by the municipality in owning and operating a waste disposal facility and the longer implementation time due to the lengthy RFP, evaluation, and negotiation steps involved. Finally, more discretion is given to the contractor in designing the facility. Since the contractor prepares the detailed design, control over specific design decisions may be lost.

A representative list of solid waste disposal facilities that have utilized the turnkey procurement method is provided in Table 7-6.

TABLE 7-4

FACILITIES USING THE CONVENTIONAL A/E PROCUREMENT METHOD

Location	Solid Waste Technology	Design Capacity (tpd)	Year Operational
Lakeland, FL	Material Recovery and RDF Production	300	1983
Ames, IA	Material Recovery and RDF Production	200	1975
Albany (ANSWERS), NY	Material Recovery and RDF Production	750	1981
Glen Cove, NY	WTE with sludge co-disposal	225	1983
Niagara Falls, NY	RDF-to-Energy	2,000	1980
Akron, OH	RDF-to-Energy	1,000	1979
Harrisburg, PA	WTE with sludge co-disposal	720	1972
Nashville, TN	WTE	1,120	1974
Hampton, VA	WTE	200	1980

TABLE 7-5

FACILITIES USING THE MODIFIED A/E PROCUREMENT METHOD

Location	Solid Waste Technology	Design Capacity (tpd)	Year Operational
Commerce, CA	WTE	400	1989
Olmsted Co., MN	WTE	200	1987
Norfolk, VA	WTE	360	1967

TABLE 7-6

FACILITIES USING THE TURNKEY PROCUREMENT METHOD

Location	Solid Waste Technology	Design Capacity (tpd)	Year Operational
N. Little Rock, AR	WTE	100	1977
Auburn, ME	WTE	200	1981
Cuba, NY	WTE	120	1983
Rome, NY	WTE	200	1985
Lane County, OR	Material Recovery and RDF Production	500	1978
Gallatin, TN	WTE	200	1981
Salem, VA	WTE	100	1978

7.4.3 FULL SERVICE WITH PRIVATE OWNERSHIP

The full-service approach represents an expansion of the contractor's role from that described in the A/E or turnkey methods. In the full service with private ownership method, the municipality assigns total responsibility to a private firm over the life of a waste disposal facility, including the design, construction, start-up, acceptance testing, operation, and ownership. The private firm also has the responsibility for providing for the equity portion of the financing. Ownership of a full-service procurement facility may involve partial equity contributions by the contractor, or by third party private investors. The full-service procurement method allows a municipal entity to acquire the solid waste stream disposal services of a facility without making itself responsible for its daily operation and maintenance.

However, it is important to note that the municipality should continue to play an active role in solid waste management. By developing the procurement process, monitoring the ongoing performance of the full-service contractor, coordinating with the appropriate regulatory agencies and continuing to have alternate responsibility for solid waste management, the municipal entity will in fact have an ongoing role in solid waste management.

The full-service approach allows for some flexibility in conducting the procurement and negotiation processes. Normally, proposals are received in response to an RFP and one vendor is selected for contract negotiations. This approach basically ends the competitive nature of the procurement process at the start of the contract negotiations. As a result, the contractor is placed in a very strong negotiating position, since the municipality usually had committed a significant amount of time and money to get to that point. In addition, the community is often faced with limited time schedules to meet regulatory requirements, which would severely restrict its ability to go back and start negotiations with the second ranked contractor.

A recent development in conducting the procurement of vendor services is to extend the competitive aspect of the procurement process by conducting contract negotiations with several qualified contractors simultaneously. These "simultaneous negotiations" are conducted after proposals have been received and serve to clarify and finalize any issues that exist in the proposals. At the end of these negotiations, the community should have a final contract agreement that is acceptable to it and to the vendors who have completed the negotiating process. This approach has been very successful on a number of waste-to-energy projects such as in Saratoga County and Huntington, New York, and can be used for other solid waste facilities such as recycling processing centers.

Under the competitive negotiation full service procurement method, the municipal entity solicits proposals with the RFP documents. Normally, the process begins with the municipal entity advertising the release of a draft RFP to contractors. The draft RFP contains some basic information such as system performance, procurement schedule, desired technology, and financing requirements. The draft RFP also requires contractors who wish to prepare proposals to submit detailed technical, managerial, and financial qualifications.

Specific evaluation criteria are stated and outlined as to how they will be used in determining the suitability of contractor replies. A pre-proposal meeting is often held after release of the RFP to assist the proposing

contractors with regard to clarification of the RFP contents, including the project schedule. Based upon the dialogue exchanged during this meeting, amendments to the RFP may be issued.

Once the contractor proposals have been received, the documents undergo detailed evaluation (technical, legal, and financial) to rank the proposals according to the criteria established in the RFP. The next step is to begin competitive negotiations with usually two or more of the top-ranked proposers as described above. Once these revised proposals have been received and evaluated, the contract is typically awarded to the single top-ranked proposer.

The competitive negotiation full service procurement with private ownership method has, in summary, the following sequence of events:

- Preparation of draft RFP
- Publication of Notice for RFP issuance from the municipal entity
- Pre-proposal meeting for contractors receiving an RFP
- Receipt and evaluation of the RFP responses by the municipal entity
- Initiation of competitive negotiations between the municipal entity and the top-ranked proposers
- Evaluation of the final proposals which include a final contract agreement with prices
- Award of the contract by the municipal entity.

The primary advantage of the full-service procurement method with private ownership using a competitive negotiation procedure is that a significant portion of the risks inherent with such a project is placed on the full-service contractor and that the equity contribution reduces the cost to finance the project. In short, the municipal entity has acquired the solid waste disposal services of a facility, but not the day-to-day responsibility for its operation and maintenance.

Major disadvantages of this method are the increased costs associated with the substantial allocation of risk to the full-service contractor; the refusal of most vendors to take certain risks under any circumstances (i.e., change in laws); loss of the facility if the project encounters insurmountable obstacles (i.e., bankruptcy of the vendor, vendor determination to leave

the business); lack of control over facility operation to ensure (i) adequate maintenance and equipment repair; (ii) continued compliance with emissions standards; or (iii) receipt of proper waste stream (i.e., limits on industrial or hazardous waste, out-of-county waste).

In addition, recent changes in the federal tax law, notably the 1986 Tax Reform Act, have made the private ownership aspect of this approach much less attractive. The ramifications of these changes are discussed in Section 7.8, Risk Assessment. The following subsection describes the full service approach with public ownership.

A representative list of solid waste disposal facilities that have utilized the full service procurement method with private ownership is provided in Table 7-7.

7.4.4 FULL-SERVICE WITH PUBLIC OWNERSHIP

In this full service procurement method, the waste disposal facility is owned by the municipal entity rather than the private sector. The design, construction, and operation of the waste disposal facility, however, are still the responsibility of the contractor.

Relative advantages and disadvantages of this procurement method are similar to those of full service with private ownership.

A significant advantage of the public ownership approach is that the municipality maintains a greater degree of control over the facility which is important since the community has the ultimate responsibility for disposal of the solid waste. This control can be exercised with regard to regulatory matters, operating issues, and contractual or financial issues. In addition, at the end of the full-service contract, the municipality either has a viable asset (such as a recycling facility) or should have a greater degree of confidence in the integrity of the landfill, since the municipal entity was involved and informed as to the operation of the facility.

If problems are encountered during the operations phase, the municipality has final control over the continuance of the character and may assume operations itself, or obtain a replacement operator. This ensures that the facility will continue to provide public service, even if the contractor is unwilling or unable to perform.

A representative list of solid waste disposal facilities that have utilized the full service procurement method with public ownership is provided in Table 7-8.

TABLE 7-7

FACILITIES USING THE FULL SERVICE PROCUREMENT METHOD WITH PRIVATE OWNERSHIP

Location	Solid Waste Technology	Design Capacity (tpd)	Year Operational
Bridgeport, CT	WTE	2,250	1988
Wallingford, CT	WTE	420	1988
Tampa, FL	WTE	1,000	1985
North Andover, MA	WTE	1,500	1985
Pittsfield, MA	WTE	240	1981
Saugus, MA	WTE	1,500	1975
Baltimore, MD	WTE	2,250	1985
Hempstead, NY	WTE	2,320	1989
Long Beach, NY	WTE	200	1988
Westchester Co., NY	WTE	2,250	1984

TABLE 7-8

FACILITIES USING THE FULL SERVICE PROCUREMENT METHOD WITH PUBLIC OWNERSHIP

Location	Solid Waste Disposal Technology	Design Capacity (tpd)	Year Operational
Pinellas Co., FL	WTE	3,150	1983
Babylon, NY	WTE	750	1989
Islip, NY	WTE	520	1989 (projected date)
Dutchess Co.	WTE	500	1987
York Co., PA	WTE	1,350	1989 (projected date)

7.4.5 NEW YORK STATE GENERAL MUNICIPAL LAW

It should be noted that in New York State, the procurement of a solid waste management facility is affected either by competitive bidding (Sections 101 and 103 of the General Municipal Law) or by Request for Proposals under General Municipal Law Section 120-w. Since the question of which procedure should be followed on a specific procurement involves legal questions, the County should obtain a legal opinion with regard to this issue prior to pursuing the procurement of a modification or expansion to an existing facility or seeking to develop a new facility.

Section 120-w of the General Municipal Law contains provisions which address unique aspects of turnkey and full-service procurements such as:

- The use of a long-term (up to 25 years) service agreements with private companies for the design, construction, and operation of facilities
- The use of long-term contracts for the sale of products (such as steam, electricity, and/or materials) recovered by the facilities.

Section 120-w also identifies the procedure for conducting the procurement process and indicates that the overall cost of the facility should be a major criterion in the selection of contractors.

7.4.6 SUMMARY AND RECOMMENDATION OF FACILITY

Procurement Methods - This section summarizes the solid waste disposal facility procurement methods discussed above.

As the preceding discussion indicates, there are significant differences between the procurement of a solid waste disposal facility and that of more traditional public works projects such as a school building. These differences include the following:

- Solid waste disposal facilities are many times the subject of immense political pressures because of the general public's concern about potential environmental impact, siting, and cost
- The implementation of solid waste disposal facilities are quite complex due to the multi-jurisdictional negotiations and contracts necessary to obtain local municipal participation and assure sufficient solid waste stream flow quantities

- Solid waste disposal facilities, in particular waste-to-energy facilities, often require long-term negotiated contracts (20-25 years) for operation, solid waste stream supply, and sale of recovered energy and/or materials

- Solid waste disposal facilities, because of the long-term contracts required, are often expected to be financially self-sufficient and as such may present greater management issues than a typical public works project.

The key responsibilities of involved parties in a solid waste disposal facility for each of the four previously discussed procurement methods is presented in Table 7-9.

TABLE 7-9

PRIMARY RESPONSIBILITIES OF INVOLVED PARTIES
BY PROCUREMENT METHOD

Stages of Project Development	A/E	Turnkey	Full Service	
			Private Ownership	Public Ownership
Facility Planning	M, E	M, E	M, E	M, E
Preparation of Facility Specifications	E	C	C	C
Facility Design	E	C	C	C
Construction Supervision and Management	E	C	C	C
Construction and Equipment Installation	C	C	C	C
Facility Startup	M, C	M, C	C	C
Facility Acceptance Testing	M, C	M, C	C	C
Facility Operation	M*	M*	C	M, C
Facility Ownership	M	M	C	M

Notes:

M = Municipal Government
E = Engineer
C = Contractor

*It should be noted that the municipal entity has the option to contract with the private sector for operation under these procurement methods.

In addition, Table 7-10 presents a summary of the procurement methods and key criteria to consider in selecting a procurement method. The level of control that the municipal entity wants to maintain is a critical issue in the procurement process. As indicated above, the community will typically continue to have the ultimate responsibility to dispose of the waste in the event of a contractor failure. Accordingly, it is appropriate for the community to maintain sufficient control to minimize the opportunity for exposure of the community to the environmental, technical, contractual, legal, and financial risks associated with solid waste disposal facilities. As the County moves forward with the implementation of its Countywide solid waste management system, it will be necessary to consider these issues in determining the procurement process for the facilities which are to comprise this system.

TABLE 7-10
KEY CRITERIA FOR SELECTION OF PROCUREMENT METHOD

Key Criteria	A/E[1]	Turnkey[1]	Full Service	
			Private Ownership	Public Ownership
Capital Cost	Low	High	Low to Moderate	High
Operating Cost	Low	High	Low	Low
Potential for Lowest Long Term Disposal Cost	High	Moderate-High	Low	High
Lead Time Required for Implementation	Low-Moderate	Moderate	Moderate-High	Moderate-High
Municipal Responsibility for Preparation of Specifications	Moderate-High	Low	Low	Low
Municipal Responsibility for System Performance During Operation	Moderate-High	Moderate-High	Low[2]	Low[2]
Municipal Responsibility for Marketing of Recovered Products	High	High	Low[2]	Low[2]
Overall Risk Assumption by the Municipality	High	Moderate	Moderate	Moderate

Notes: (1) The A/E and turnkey approaches are construction-related procurement methods, and therefore, the decision on operation approach (public or private) may impact the discussion of the operating issues.

(2) Responsibility for these areas is typically the vendors responsibility, however the municipality can take contractual responsibility in either public or private ownership.

It is recommended, at this time, that the facilities to be developed by the UCRRA should be publicly procured either pursuant to Sections 101 and 103 or Section 120-w of the General Municipal Law. This will ensure maximum control over the design and construction of the facilities.

7.5 FACILITY OWNERSHIP

Ownership of a solid waste disposal facility is one of the most important decisions a municipal entity must make. There are basically only two methods of ownership that can be considered:

- **Public Ownership**
- **Private Ownership**

This section will discuss the key factors that should be evaluated in analyzing different ownership arrangements and the relative advantages and disadvantages for each.

7.5.1 PUBLIC OWNERSHIP

In a public ownership arrangement, a solid waste disposal facility is usually owned by the municipality whose solid waste stream is disposed of at that facility. This may be the County, one or more municipalities in the County, or an autonomous public entity such as an industrial development or municipal authority. Public ownership arrangements have historically been used for public works facilities such as water and wastewater treatment plants, roads, and school buildings. It is worth noting that private operation is an option in a public ownership approach.

A major advantage associated with public ownership is the level of control the municipality maintains. This control can manifest itself in a number of ways including: in negotiations with regulatory agencies regarding permitting issues; in directing private operators to comply with contractual or regulatory requirements; and, in using municipal employees to operate the facility or monitor the day-to-day activities of a private operator. In addition, with the recent changes in tax laws, the economic advantages associated with private ownership such as accelerated depreciation and investment tax credits have been greatly reduced. Through public ownership, the community would both own a viable asset (in the form of a recycling, compost, or waste-to-energy facility) and would retain the residual value of the facility. In the case of a landfill, the community can play a more active role in controlling the

operation of the site and have direct control over future uses and any future monitoring activities.

Disadvantages to public ownership include a more direct involvement in the risks associated with operation and ownership of such facilities. To some extent, operating risks (such as operating costs, technical issues, regulatory compliance) can be shifted to a private operator through either a full-service contract or in the case of an A/E or turnkey procurement through an operating contract.

A representative list of solid waste disposal facilities that have public ownership arrangements is provided in Table 7-11.

7.5.2 PRIVATE OWNERSHIP

In a private ownership arrangement, a solid waste disposal facility is owned by a private firm, typically the full-service contractor. This typical ownership arrangement became quite popular in the 1970's and early 1980's as a result of the tax advantages available under the tax laws in place at that time.

From the standpoint of the municipal entity, private ownership can help offset some of the construction capital costs, in that equity capital contributed by the private owner may be applied towards the debt. The equity capital provided by the private owner usually takes the form of either a lump-sum contribution ("upfront equity") or several annual contributions ("deferred equity") during the initial life of the facility. Regardless of which form is preferred, the equity contributions must be structured such that the private firm be recognized as the owner if any tax benefits are sought. The private equity contribution is typically augmented with either tax-exempt or taxable bonds to complete the financing.

Currently, approximately two-thirds of all waste-to-energy disposal facilities in operation or under construction are privately owned. However, the 1986 Tax Reform Act has had a major impact on this trend. This Act significantly reduced some of the tax benefits previously available for private owners of waste disposal facilities. Changes included the reductions in available tax-exempt industrial development bonds (IDB's) for financing the construction, the loss of investment tax credits, classifying passive activity losses as not tax deductible and the phasing out of accelerated cost recovery system (ACRS) for depreciation. These tax reform impacts are discussed further in Section 7.6, Financing and Funding Assistance.

The primary advantage of private ownership has been the economic benefits of reduced capital cost by having the private owner pass the tax advantages to the community in the form of an equity contribution. As previously indicated, this advantage has been reduced by changes to the tax laws. Another advantage offered by private ownership is placing the risks associated with the day-to-day operation of the facility on a private firm. This approach can be valuable, particularly when the community does not have the resources or technical capability to operate the facility.

A disadvantage of a private ownership arrangement is that the municipal entity will not own the solid waste disposal facility even though its taxpayers have contributed significantly towards retirement of the bonds used to finance its construction. Another disadvantage of a private ownership arrangement is that the municipal entity will have limited control over operation of the facility.

A representative list of solid waste disposal facilities that have private ownership arrangements is provided in Table 7-12.

7.5.3 SUMMARY AND RECOMMENDATIONS ON FACILITY OWNERSHIP METHODS

Table 7-13 presents a comparison of key factors that should be considered in evaluating the ownership approach to be taken to solid waste management facilities. In addition to these factors, other issues which can affect the ownership decision include the procurement approach utilized, the risk appetite of the community, and the type of facility. During the implementation of the Countywide solid waste management program by the County, it will be necessary for the County and UCRRA to determine the most appropriate ownership approach for the facilities needed.

To ensure proper construction, operation and control of major disposal facilities, it was recommended that the facilities be owned by the public. It is possible for a facility to be operated by the private sector. However, reporting and inspection programs must be put in place to ensure proper operation.

7.6 HOST COMMUNITY PROGRAM

The siting of solid waste management facilities will result in at least one municipality having to serve as the host community for such facilities. Since these

TABLE 7-11

FACILITIES USING PUBLIC OWNERSHIP ARRANGEMENTS

Location	Solid Waste Technology	Design Capacity (tpd)	Year Operational
Dade Co., FL	RDF-to-Energy	3,000	1988
Pinellas Co., FL	WTE	3,150	1983
Albany (ANSWERS), NY	Material Recovery and RDF Production	750	1981
Babylon, NY	WTE	750	1989
Cuba, NY	WTE	120	1983
Glen Cove, NY	WTE with sludge co-disposal	225	1983
Islip, NY	WTE	520	1989
Dutchess Co., NY	WTE	500	1987
Rome, NY	WTE	200	1985
York Co., PA	WTE	1350	1989 (projected)

TABLE 7-12

FACILITIES USING PRIVATE OWNERSHIP ARRANGEMENTS

Location	Solid Waste Technology	Design Capacity (tpd)	Year Operational
Bridgeport, CT	WTE	2,250	1988
Wallingford, CT	WTE	420	1988
Tampa, FL	WTE	1,000	1985
North Andover, MA	WTE	1,500	1985
Pittsfield, MA	WTE	240	1981
Saugus, MA	WTE	1,500	1975
Baltimore, MD	WTE	2,250	1985
Hempstead, NY	WTE	2,320	1989
Long Beach, NY	WTE	200	1988
Niagara Falls, NY	RDF-to-energy	2,000	1980
Westchester Co., NY	WTE	2,250	1984

TABLE 7-13

KEY FACTORS FOR CONSIDERATION
IN DETERMINING FACILITY OWNERSHIP

Key Factor	Ownership Method: Public	Ownership Method: Private
Control Over Project	High	Low
Allocation of Operating Risks	Moderate	Low
Initial Cost to Ratepayers	High	Moderate
Final Cost to Ratepayers	Moderate	High
Recovered Resources Revenue	To the Municipal Entity	To the Private Owner
Book Value Assets After Amortization and Retirement of Bonds	To the Municipal Entity	To the Private Owner
Facility Availability	High	Moderate

facilities will serve the entire County, typically some benefits or form of compensation are provided to the host community.

In some cases a host community program is structured to offset the impact on the community (such as road improvements for additional traffic), while in other situations a general fee is assessed to the project and these funds are provided to the community for its use.

Generally, a host community program will contain some or all of the following:

- **Property tax payments**
- **Recovered energy provisions**
- **Local infrastructure improvements**
- **Payment per ton**
- **Additional environmental protection**
- **Property value protection**

o **Property Tax Payments** - Property tax payments provide the host community with economic benefits. This benefit can be actual property taxes if the facility is privately owned, or a payment in lieu of taxes if the facility is publicly owned. The establishment of equitable payments to the host community is a complex process which typically considers such factors as zoning, present use,

natural resources, development potential, and tax base. Payments can be negotiated to compensate the host community for the property tax revenue it would have received if the site was developed for some other commercial, industrial, or even residential use. This payment can also be structured to address either actual or perceived financial impact of the facilities upon the community. These impacts could include support services such as fire protection, utilities (water, sewer, and electric), and access roads. The cost of improvements for these services could be included in a payment in lieu of a tax agreement.

- **Recovered Energy Provisions** - This type of payment is typically associated with a waste-to-energy (WTE) facility. Recovered energy provisions can provide the host community with the economic benefit of reduced utility costs. Steam or hot water from a WTE facility can be sold at a negotiated discount rate to the host community if there is a demand for such utility service. Based upon the identification of energy markets within Ulster County, there does not appear to be any demand for these recovered energy products in the potential host communities. Another approach that could be used is the sale of electric power at a discount to the host community as part of the energy sales agreement between a WTE facility and an electric utility such as Central Hudson Gas & Electric Corporation (CHG&E). As a result the host community would receive reduced electric power costs. This could be structured so that business, industry, and residents would all realize this benefit. Furthermore, reduced electric power rates could be used as an incentive to provide for increased development, thereby broadening the tax base.

- **Local Infrastructure Improvement** - Here the host community is typically compensated by the project in the form of new or upgraded municipal infrastructure items such as roads, water treatment plants, or wastewater treatment plants. Other potential infrastructure items include schools, hospitals, municipal buildings, or assisting the community in addressing its local environmental issues such as landfill closure.

- **Payment Per Ton** - This involves the direct payment of monies to the community for each ton of solid waste delivered to the disposal facility site within the host community. This is the most often used approach since it provides the community with a significant amount of flexibility in applying the funds received to meet their own needs. While the

amount of per ton fee is typically negotiated between the project sponsors and the host community, the act establishing the Agency (Article 13-G of the Public Authorities Law) provides that up to $1.25 per ton of solid waste processed at the facility be paid to the host community in accordance with the following apportionment:

> $1.00 or portion thereof to the Town or City in which the facility is located and $.25 or portion thereof to the Fire District (or to the City for fire protection purposes) in which the facility is located (Section 2050-t(8)(b) Public Authorities Law).

Another possible alternative may be to allow the residents of the host community to use the waste disposal facility free of charge.

- **Environmental Protection** - Concerns raised by the host community regarding environmental impacts should also be addressed in a host community benefit package. Obviously, UCRRA will take all appropriate steps to comply with permitting requirements and to mitigate environmental impacts as part of its basic work. However, additional measures might be considered. For example: extra monitoring wells at a landfill site; the placement of a conservation easement or buffer area around the site; providing individual homeowner water supply protection agreements; or development of a central public water supply.

- **Real Property Value Protection** - Properties which are part of a site, as well as properties forming a buffer area around a site will need to be acquired. However, most properties in the general area of the facility will remain in private ownership. Agreements with these property owners could be negotiated providing for studies to be undertaken to ensure that property values have not been impacted by the facility.

7.6.1 Summary of Host Community Programs and Recommended Action

The above-described host community program represents some of the approaches that have been utilized on other projects around the state. This was not intended to be an exhaustive list, since each project may involve its own unique circumstances. Each type of host community program can be tailored to address the needs of the host community and individual property owners. The host

community program ultimately provided should be the result of negotiations between the host community and the project sponsors.

UCRRA recognizes that a framework for the host community program should be developed at this point. Specific elements of the host community program regarding a particular site can be determined only after negotiations with the host community.

It is recommended that the Citizens Advisory Committee consider and propose for approval a final generic host community program, providing for a technical team component, that is, a component which allows the host community to participate in the review and analysis of technical data obtained and developed by UCRRA. The generic program should call for, at a minimum, the following:

1. Establishment of a negotiating team including representatives of the UCRRA Board, UCRRA Executive Director, UCRRA staff and consultants.

2. Establishment of a negotiating team representing the community which could consist of the following:

   a) the Chief Executive Officer of the Municipality or a designated Municipal Board Member; b) a professional engineer hired by the Municipality; c) the Planning or Zoning Board Chairman of the Municipality; d) possibly, the Municipal Highway Superintendent, unless it is felt that the Municipal Engineer can cover the road and traffic impacts of any facility; e) one County Legislator from the district where the facility is located; and, f) citizens living in the immediate area (within one mile) of the proposed site, as well as citizens "at large" from the Municipality in which the facility is located. The number of citizens would be equal to the number of Municipal elected or appointed officials on the team.

3. The subject matter to be discussed could include, but not be limited to property tax payments; local infrastructure improvements; a payment per ton for solid waste processed or disposed of; site-specific concerns regarding environmental protection; and real property value investigation.

UCRRA should be prepared to offer the generic plan to a potential host community prior to the commencement of permitting procedures pursuant to 6 NYCRR Part 360.

After establishing the negotiating teams, UCRRA should negotiate a community specific host community agreement for approval by the negotiating committee, and eventual approval and acceptance by UCRRA and the local governing body.

Finally, the development of a survey procedure would be helpful in defining issues of relevance and concern to host communities, and the County as a whole. It is recommended that a survey should be conducted by a professional unbiased pollster.

7.7 FINANCING AND FUNDING ASSISTANCE

The construction and operation of solid waste management facilities involve substantial capital expenditures and operating budgets. Accordingly, an examination of financing and funding assistance alternatives is appropriate.

Generally, solid waste management facilities are financed by public sources, private sources, or some combination thereof. The cost of financing also must be considered when evaluating terms, issuance costs, and interest rates. In addition, it may be possible to obtain grants or subsidies which can aid in the financing of such a project.

There are several methods available to the County for obtaining financing for solid waste management facilities:

- **General Obligation Bonds**
- **Municipal Revenue Bonds**
- **Industrial Development Bonds**
- **Leveraged Leasing (Equity)**
- **Private Equity**
- **Other Sources**

Following is a discussion of these financing instruments and evaluation of the advantages and disadvantages of each.

7.7.1 GENERAL OBLIGATION BONDS

General obligations (G.O.) financing is backed by the full faith, credit, and taxing power of the issuing municipal government. As a result, the credit rating of the governmental entity is the primary determining criterion as to the cost of financing rather than the technical or marketing risk associated with the project.

G.O. bonds are secured by a pledge of ad valorem taxes despite the possibility that the bonds may be paid from other sources of unrestricted income like income taxes, sales taxes, and other fees. Therefore, G.O. bonds normally carry the lowest interest rate among available financing sources. G.O. bonds have been used in the U.S. to finance such diverse projects as airports, water and wastewater treatment plants, sports stadiums, and transportation projects. G.O. bonds may continue to be paid by the municipality even after the facility for which they were issued has stopped functioning. The low interest rate is the expected outcome when a municipal entity produces the guarantees to back such an instrument.

In determining whether G.O. bonds are appropriate for financing the County's solid waste disposal facilities, certain considerations should be factored into the evaluation. These factors include, but are not limited to:

- **Current credit rating of the County**
- **Debt ceiling on the issuing body's borrowing capacity**
- **Projected impacts of the financing on the issuing body's credit rating**
- **Availability of other types of financing.**

A major advantage of G.O. bonds is that they are considered among the most secure municipal tax-exempt bonds and, as such, usually involve a comparatively low interest rate. Another major advantage of G.O. bonds is that the issuance of such instruments is one of the least complex forms of debt offerings. Therefore, the potential for delays in the bond offering is reduced and issuance costs should be lower than other forms of bond financing.

The primary disadvantage of G.O. bond financing is the potential to compromise the issuing municipal entity's borrowing capacity for other necessary municipal projects and needs. For that reason, many solid waste projects have utilized other types of financing to avoid utilizing this borrowing capacity.

7.7.2 MUNICIPAL REVENUE BONDS

Municipal Revenue Bonds (revenue bonds) are long-term, tax-exempt obligations that are payable from the project revenues or revenues from other facilities owned by the government of general jurisdiction (such as Ulster County) or a public benefit corporation (such as UCRRA). Revenue bonds are also referred to as project revenue bonds since (unlike G.O. bonds) the success or failure of the project directly affects the ability to repay the debt.

Revenue bonds for a solid waste disposal facility rely on the revenue generated, such as user tipping fees and material and/or energy recovery revenues. Generally, revenue bonds issued by a municipality require a pledge to set and collect rates for use of the facility that equal the operating expenses, bond principal, and interest during the life of the issue.

Interest rates on revenue bonds are usually higher than the interest rate on G.O. bonds since the instrument contains more risk and because repayment depends upon success of the project. Determination of the issue interest rate is a complex process that requires a bond rating agency to review the financial feasibility of the project, the contractual arrangements between the involved parties, and other matters. Because the potential for unforeseen revenue shortfalls is implicit with the increased risk of revenue bonds, such instruments necessitate the formation of a debt service reserve fund as protection against this event.

7.7.3 INDUSTRIAL DEVELOPMENT BONDS

Industrial development bonds (IDBs) represent a specific form of municipal revenue bonds. IDBs are tax-exempt long-term bonds issued by a public benefit corporation acting on behalf of the municipality. The purpose of IDBs is to foster industrial or economic development. This type of financing has been used extensively for solid waste disposal facilities.

The use of IDBs to finance a project results in the project either being leased or sold to a private corporation, or in some instances, the bond proceeds are loaned to a private corporation. Although IDBs have been successfully used for solid waste disposal facility financing, the Federal Tax Reform Act of 1986 (the Act) has significantly changed the use of such an instrument. For example, the Act reduced the tax-exempt IDB allocation for privately owned WTE projects. Therefore, privately owned projects must now compete with all types of industrial development projects for a share of the State's allocation during the year. The allocation limit established in the Act is set at $50 per capita or $150 million per state. Another impact the Act had on IDBs was to restrict tax exempt financing of non-qualifying costs. In certain cases, non-qualifying equipment costs are limited to 5 percent of tax-exempt issuances. Thus, under this "95/5 rule", expenses for the construction or installation of equipment related to the sale of by-products from the facility are not tax-exempt. Examples of non-qualifying equipment include turbine-generator sets for a WTE facility and magnetic separation equipment

for the recovery of ferrous metal in a material recovery facility. Therefore, these portions of the facilities expenses must now be financed with taxable debt.

7.7.4 LEVERAGED LEASING

Leveraged leasing is a financing alternative rather than a financing instrument like bonds. In leveraged leasing, the intent is to finance the project so that the project participants will gain either tax benefits or lower financing costs. These benefits are realized when equity investor funds are leveraged by a "passive" third party investor who then leases the facility to the user or operator. This financing alternative can be successfully utilized when the user or operator cannot obtain the full tax benefits of facility ownership. Therefore, the involvement of a third party, to provide the equity contribution and lease back the facility, can provide lower financing costs for the community.

7.7.5 PRIVATE EQUITY

Private equity is another financing alternative available for solid waste disposal facilities. Private equity involves capital contribution from the facility developer or third parties such as commercial banks, insurance companies, and private investors. This alternative is restricted to privately owned facilities.

In a private ownership structure, private equity as some percentage of the capital construction cost is invested by the developer or possibly a third party. This contribution can be made up front during the construction phase as a lump sum or spread out over a fixed term in installments. The lump sum method has the advantage of lowering the required bond size while the installment method has the advantage of subsidizing tipping fees during that term.

The private equity contributed by investors allows the developer to own the facility for tax purposes. The owner's rate of return is generated from a share of the project energy and/or materials recovery revenue, any management fees, and the attainment of tax benefits as owner of the facility.

The Tax Reform Act of 1986 has significantly reduced the attractiveness of private equity as a financing source for solid waste disposal facilities. Examples of significant changes include the elimination of the 10 percent investment tax credit, doubling of the depreciation schedule for both real and personal property from 5 to 10 years, and the reduction of the use of tax-exempt debt for facilities.

7.7.6 OTHER SOURCES

In addition to the alternatives described above, there are other sources that may be used to finance solid waste facilities. An example would be the use of bank loans. This approach is typically used for smaller projects which do not require enough capital to warrant a bond issue and may have shorter repayment schedules.

7.7.7 SUMMARY OF FINANCING SOURCES AND RECOMMENDATIONS

There are numerous financing sources for a solid waste disposal facility available to the County. Instruments such as G.O. bonds, revenue bonds, IDBs, and an alternative like leveraged leasing may be utilized alone or in various combinations.

The decision of which financing sources should be used is a complex one that is intertwined with the facility procurement, ownership, and risk assessment considerations.

It is recommended that revenue bonds issued by UCRRA should be used to finance solid waste management facilities. This will not adversely impact the County's debt limit and will lessen the impact on the County budget by shifting the support for the facility from the taxpayer to the user of the facility. The financial support for the facility would be paid for by tipping fees instead of real property taxes.

7.7.8 REVIEW OF FUNDING ASSISTANCE AND RECOMMENDATIONS

Funding assistance, typically in the form of grants or low interest loans, may also be available to offset the costs associated with the solid waste management program. Such funding may be available from federal, state, and/or local sources. Historically, the federal government has not provided direct funding for solid waste programs. However, prior to the Tax Reform Act of 1986, significant tax advantages were available. The principal source of funding assistance has been the states. In the case of New York State, there are several sources of funding available. For recycling activities, the Local Resource, Reuse and Recovery Program (LRRRP) and Environmental Quality Bond Act (EQBA) provide funding for public education and recycling equipment, respectively. UCRRA has received grants pursuant to each program. No funding is available for constructing solid waste management disposal facilities at this time. Another state funding source is the Solid Waste Management Planning grant program which provides monies for the development of a

county's solid waste management plan. UCRRA has received a grant pursuant to this program.

The County and the Agency should continue to monitor state as well as federal activities to determine if other sources of funding will become available, and whether such funding is applicable to the County's program.

7.8 RISK ASSESSMENT

There are five primary risk areas typically associated with implementing a solid waste disposal facility:

- **Solid waste stream flow risk**
- **Recovered products risk**
- **Legal and regulatory risk**
- **Facility construction risk**
- **Facility operation risk**

Typically, these risks are not insured in solid waste management projects, and as such represent real risks the project sponsors need to consider. The following sub-sections discuss the elements comprising these five risk areas. A general discussion of how to minimize or allocate the risk is also presented.

7.8.1 SOLID WASTE STREAM FLOW RISK

There are two primary risk elements associated with the solid waste stream flow. First, there is the potential for not having a sufficient quantity of solid waste delivered to the disposal facility. Second, there is a risk in having detrimental characteristic changes in quality of the solid waste.

Responsibility for reducing the first risk element has historically belonged to the municipality. The municipality must guarantee that the solid waste stream generated within its jurisdictional boundaries will be routed and delivered to the waste disposal facility. Methods of achieving this flow control are outlined in Section 7.1.

The second risk element involves the potential impact of detrimental changes in the quality of the solid waste deposited at the facility. For example, the percentage of various types of paper, plastic, and metals can affect the operation of a recycling or a waste-to-energy facility. Since neither the municipality nor the operator of a solid waste facility has direct control over the composition of the solid waste, this is an area of risk which can be shared contractually.

In summary, solid waste stream flow control for guaranteeing quantity is generally the responsibility of the municipality, while the risk associated with waste composition is generally allocated to the vendor or shared by the municipality and the vendor.

7.8.2 RECOVERED PRODUCTS RISK

The primary risk element associated with recovering materials and/or energy from a solid waste facility, is that a lower than expected product revenue might occur. Reduced revenues may result from fewer amounts of recovered products being captured or may be the result of variations in market conditions. Recovered products may include energy such as steam, hot water, or electric power and may also include materials such as paper, glass, aluminum, plastic, and ferrous metal.

Should lower prices in the market occur, then there is a risk of a revenue shortfall. Perhaps the best method for reducing this risk is to enter into long-term contracts for sale of the recovered products. This has historically been easier to achieve for the sale of recovered energy products than for recovered material products. Problems associated with obtaining long-term contracts for recovered materials include unstable markets, lack of state of federal market development or support, stringent product specifications, and the variable quality of the recovered materials. UCRRA has been able to enter into market agreements of up to five years for its recovered materials, thus providing some price and market stability.

7.8.3 LEGAL AND REGULATORY RISK

The implementation of a solid waste management program can involve a wide range of legal and regulatory issues representing risks which must be addressed by the municipality or private sector. Following are three major examples of these types of risks:

- **Environmental permitting risks**
- **Tax code change risks**
- **Change-in-law risks**

Risks due to environmental permitting arise from the realization that the permitting of a solid waste disposal facility can be one of the most time-consuming and difficult steps in the entire implementation process. Reasons for this include both the voluminous amount of data required for permit applications and the distribution of permit reviews among many federal, state, and local agencies.

In addition, there are a wide range of environmental and regulatory issues that must be addressed during the permitting process. These issues can include health risk assessments, approval of long-term energy agreements, assessing potential impact on sensitive environmental resources and acquiring local building permits. Addressing these permitting issues, involves a lengthy and complicated process that typically makes the municipality, its legal and technical advisers, and the private sector firm during the design and construction work responsible for the risks associated with these activities.

Tax code changes represent a specific area where the municipality can shift the risk to the private sector. This approach has been utilized in many full-service projects, and with the changes in the 1986 Tax Reform Act it represents an area where the vendor should be willing to accept this risk.

In addition to tax code changes, the potential for changes in other laws and regulations represents another risk communities face when developing solid waste management programs. These types of changes can involve changes in environmental regulations that require new or different standards for siting construction and/or operation of various facilities. This risk is virtually always one the community must bear since private vendors are very reluctant to commit to meeting standards or requirements that they are unaware of at the time of entering into a contract.

7.8.4 FACILITY CONSTRUCTION RISK

There are many risks associated with facility construction. Chief among these are:

- **Facility design errors and omissions**
- **Underestimation of facility construction**
- **General inflation**
- **Failure of contractor to meet schedule due to events such as subcontractor problems or strikes**
- **Problematic subsurface conditions**
- **Force majeure**

In the case of a full service procurement method, these risks can usually be allocated to the contractor with the exception of force majeure events. This is possible since the contractor is normally responsible for the design, technology performance, and equipment in this procurement method. Other facility construction risks within the reasonable control of the contractor are also the burden of the contractor. Examples include, but are

not limited to, total construction price, construction time, and performance of the subcontractors within budget and on schedule. Typically, these risks are insured against under project insurance policies and construction and performance bonds.

Facility construction risks that are normally the burden of the municipal entity include uncontrollable events and force majeure. Examples of these risks are:

- **Earthquakes**
- **Floods**
- **Other natural disasters**
- **Sabotage**
- **War, declared or undeclared**
- **Explosions**
- **Any other acts of God**

Although these risks may be significant, they typically can be minimized by obtaining specific insurance policy coverage.

7.8.5 FACILITY OPERATION RISK

Important risks associated with the operation of a solid waste disposal facility include, but are not limited to:

- **Unexpected high operating costs**
- **Facility damage and unscheduled downtime resulting from the processed solid waste**
- **Increased regulation and cost for non-processible facility residue**

The use of a full service procurement or private sector operation of the facilities reduce the risk to the municipality by sharing, or allocating most of them to the contractor.

7.8.6 SUMMARY OF RISK ELEMENTS AND RECOMMENDATION

The feasibility of siting and constructing County solid waste facilities is strongly influenced by the assessment of potential risks and their equitable allocation among the project participants. A summary of risk factors and typical allocation is provided in Table 7-14. UCRRA should negotiate as favorable an allocation risk as possible for all of the facilities it develops.

7.9 IMPLEMENTATION APPROACH AND SCHEDULE

The preferred solid waste management system for the County involves developing a Recycling Satellite Aggregation Center System, establishing municipal yard waste composting facilities, permitting/constructing a Part 360 State-of-the-Art landfill, and building other waste processing facilities as deemed appropriate or necessary. A detailed implementation schedule for each program can be found in Chapter 9.0.

TABLE 7-14

ASSESSMENT OF RISK ELEMENT ALLOCATION
FOR A SOLID WASTE DISPOSAL FACILITY

			Full Service	
	A/E	Turnkey	Private Ownership	Public Ownership
Solid Waste Stream				
Insufficient quantity	M	M	M	M
Negative compositional changes	M	M	M	M
Recovered Products				
Lower than expected revenue	M	M	M	M
Legal and Regulatory				
Environmental permitting	M	M	C,M	M
Tax code changes	C	C	C	C
Change in Law and Regulations	M	M	M	M
Facility Construction				
Design problems	M	C	C	C
Poor equipment performance	C	C	C	C
Ground and subsurface problems	C,M	C,M	C,M	C,M
Inflation and cost overruns	C,M	C,M	C	C
Force Majeure	M	M	M	M
Other	C,M	C,M	C,M	C,M
Facility Operation				
Acceptance Testing	M	C	C	C
Facility damage from waste	M	M	M,C	M,C
High operating costs	M	M	C	C
System Performance	M	M	C	C
Residue disposal	M	M	C,M	M
Environmental Compliance*	C	C	C	C
Force Majeure	M	M	M	M

Notes:

M = Municipal Government
C = Contractor

*If privately operated, then the risk of environmental compliance is typically shared.

When implementing this project, issues related to four general areas (called implementation milestones) must be resolved through either studies, design, or other similar actions. The four milestones the Agency expects to encounter include: feasibility analysis, procurement and financing, construction, and operation. The key issues to be resolved are presented in Table 7-15. The development and implementation of Countywide recycling programs is being undertaken at the same time as the comprehensive solid waste management plan is being developed and finalized.

Likewise, site and technology specific environmental impact statements are to be prepared in conjunction with design and permitting activities all during the same three-year period (1991-1994). This ambitious schedule reflects reasonable time frames for conducting various phases, but does not provide for significant delays that may be encountered during public review or permitting processes.

TABLE 7-15

IMPLEMENTATION MILESTONES

Projected Feasibility Analysis:

- Solid Waste Stream Quantification and Characterization
- Current Solid Waste Management Practices Analysis
- Material and Energy Market Analysis
- Review and Selection of the Technology
- Siting Study
- Permitting Review
- Implementation Approach Analysis
- Discussion

Procurement and Financing:

- Acquire Site
- Obtain Contracts for Material and Energy
- Solid Waste Stream Flow Control and Guarantees
- Permit Application
- RFO/RFP Issuance
- Negotiate and Award Contract
- Develop Financing and Bonding

Construction:

- Site Preparation
- Final Design
- Specify and Order Equipment
- Contract Facility and Install Equipment
- Startup and Acceptance Testing
- Certificate of Completion

Operation:

- Tipping Fees
- Escalation Rates
- Service Fee Payment
- Periodic Testing

Specific aspects of the implementation schedule are discussed below and in great detail in Chapter 9.0 of this document.

- **Solid Waste Management Plan** - Approval of the plan was obtained by the UCRRA in March, 1991. County legislative approval is expected by May, 1991 and NYSDEC approval by December, 1991. The plan calls for additional studies to be undertaken. They will be commenced as soon as plan approval is received in accordance with the following schedule:

  - Medical Waste - study will be commenced by mid-1991 and completed by December 1991.

  - Sewage Sludge Study - will be commenced by late 1991 and will be completed by mid-1991

  - Municipal Solid Waste Composting - study will be commenced by mid-1991 and will be completed by December 1991.

  - Household Hazardous Waste Facilities - study will be commenced in late 1991 and will be completed by December 1992.

- **Recycling and Yard Waste Composting** - Development projects were completed in the Fall of 1990. The SAC System implementation began to be phased in at the same time as the Intermunicipal Agreements (IMA), purchase and installation of equipment and hauling and marketing arrangements were implemented.

The interim SAC System and yard waste composting system is operational as of the date of this study.

The schedule for development of the next phase is described below:

- Permanent SAC Facilities - design, permitting, and implementation - to be recommended immediately upon plan approval and implemented by 1992.

- Review of SAC System; consideration of MRF system - to be commenced in 1993 and completed by 1994.

- Mandatory Source Separation and Recycling Legislation - to be prescribed in draft to UCRRA by May, 1991 and sent to the County Legislature for consideration soon thereafter. It is expected that a local County law will be adopted by September 30, 1991 to take effect for residences on March 31, 1992 and commercial establishments on September 30, 1992.

- **Landfill** - A siting study has been completed through the exclusionary phase for this Plan. The UCRRA will review the identified candidate areas immediately upon approval of the Plan and will undertake the following work:

  - Analyze past exclusionary phase siting study - to be completed by December 1991.

  - Perform on-site hydrogeologic and soil stability analyses, if authorized - to be completed by April 1992.

  - Select a site for site-specific environmental review and permitting - April 1992; commence SEQRA review and permitting immediately upon selection.

  - Obtain construction permit, purchase property, September 1993 - commence construction of first cell immediately thereafter.

  - Complete construction, obtain operations permit, and commence operations - June 1994.

- **Waste Stream Control** - Waste stream control will have to be implemented as part of the Plan.

  - Negotiate a disposal agreement between the County and UCRRA - commence January 1993, complete by September 1993.

  - Obtain flow control legislation from the County Legislature - effective September 1993.

- **Financing** - Financing for projects will, no doubt, be revenue bond financing. The County has provided "seed money" for the UCRRA's work so far. Review of financing alternatives has already been commenced.

  - Review availability of interim financing - to be completed by December 1991.

  - Prepare permanent financing package for landfill development and repayment of County advances - to be completed by December 1992.

  - Issue bonds - September 1993.

8.0 LANDFILL SITING ANALYSIS

8.0 LANDFILL SITING ANALYSIS

8.1 GENERAL

Proper siting of a landfill is a powerful tool to reduce potential environmental impacts. The siting process can eliminate sites which will have visual, air quality, traffic, and other adverse impacts and, more importantly, can reduce the possibility of water quality degradation from accidental or long-term containment failure. Ideal sites should be distant from valuable groundwater or surface water resources and at a location with abundant clay-rich soils. When such a site is used for a landfill, the trace amounts of leakage which can be anticipated from modern landfills would be attenuated readily by natural processes to prelude significant levels of groundwater contamination.

New York State's Part 360 regulations include provisions for proper landfill siting. These include prohibitions from siting landfills on lands which contain:

- Certain agricultural lands;
- Flood Plains;
- Habitats of endangered species;
- Regulated wetlands;
- Primary water supply and principle aquifers;
- Unstable areas; and
- Unmonitorable or unremediable areas.

Landfills accepting putrescible waste must also meet certain setback requirements from airports. The regulations also include requirements for conducting the siting process, site evaluation criteria, and other factors which must be considered in siting.

As part of the development of the solid waste plan and GEIS, UCRRA initially conducted a siting study for the purpose of finding a site or sites that could accommodate several co-located facilities including a Countywide landfill. UCRRA also conducted a Supplemental Siting Analysis which concentrated on finding a site for a landfill. This siting is contained in the S-DGEIS.

For the purposes of the Plan, the supplemental siting study was performed in stages and identified 23 potential candidate areas for the landfill facility.

It must be emphasized that UCRRA has not yet selected a preferred site. At a minimum, UCRRA plans to conduct further detailed hydrogeologic and soil stability testing on at least two candidate areas before making any final site determination.

Following is an overview of the site selection methods used to arrive at the recommendations and conclusions found in the siting studies. For a detailed discussion of the siting process, the reader is referred to:

a) DGEIS, Volume I, Section 7.0
b) DGEIS, Volume III, Appendices E, F, and G
c) Response Document to the DGEIS, Sections 7.0 and 8.0
d) Supplemental DGEIS, Section 2.0
e) Supplemental Response Document to the S-DGEIS, Section 2.0

8.2 HISTORICAL DISCUSSION - DGEIS SITING STUDY

The purpose of the initial siting study (contained in the Draft GEIS) was to find the most appropriate site suitable for several recommended technology types: waste-to-energy, landfill and recycling facilities. The siting study considered regulatory restrictions and guidelines as well as environmental, technical, and socio-economic factors to identify a proposed site for the development of several solid waste management facilities. This five-phase iterative approach covered three technology types; recycling, composting, landfilling, and waste-to-energy, and included the option of siting them together at one location (co-located) or siting them at separate locations:

Phase 1. Exclusionary Phase
Phase 2. Suitability Selections Phase
Phase 3. Evaluation Phase
Phase 4. Site Identification Phase
Phase 5. Site Investigation

PHASE 1. - **Exclusionary Phase** - Here, areas of the County containing parks and preserves, slopes more than 15 percent, flood plains, wetlands, waterbodies, commercial and residential developments, and certain agricultural districts were excluded. Also excluded were environmentally sensitive areas as well as other areas unsuitable for the development of a co-located solid waste management facility, leaving the remainder of the County to be subjected to further study.

PHASE 2 - **Suitability Selection** - Suitability selection criteria were used to identify candidate areas from the portions of the County that were not excluded in Phase 1. These criteria included areas within one mile of a major roadway, on or adjacent to municipal solid waste facilities, and on or adjacent to active, inactive, or planned industrial development. In Phase 2, twelve candidate areas to be subjected to the evaluation and ranking process in Phase 3. See Figure 8-1 for location of 12 candidate areas.

PHASE 3. - **Evaluation and Ranking** Using a series of economic, social, and environmental criteria for each technology type, the 12 candidate areas were numerically ranked. A rating and weighing system was used to evaluate each area for composting/recycling, landfill, and waste-to-energy facilities.

Candidate area evaluation scores were thus obtained for these three technology types, determining, at the conclusion of Phase 3, that there are 8 potentially suitable sites for any or all technologies. Since it was recommended in the Draft GEIS that it would be most efficient to locate all three technology types at one site, the scores for each area were weighted and totaled. Three candidate areas with the highest scores were identified.

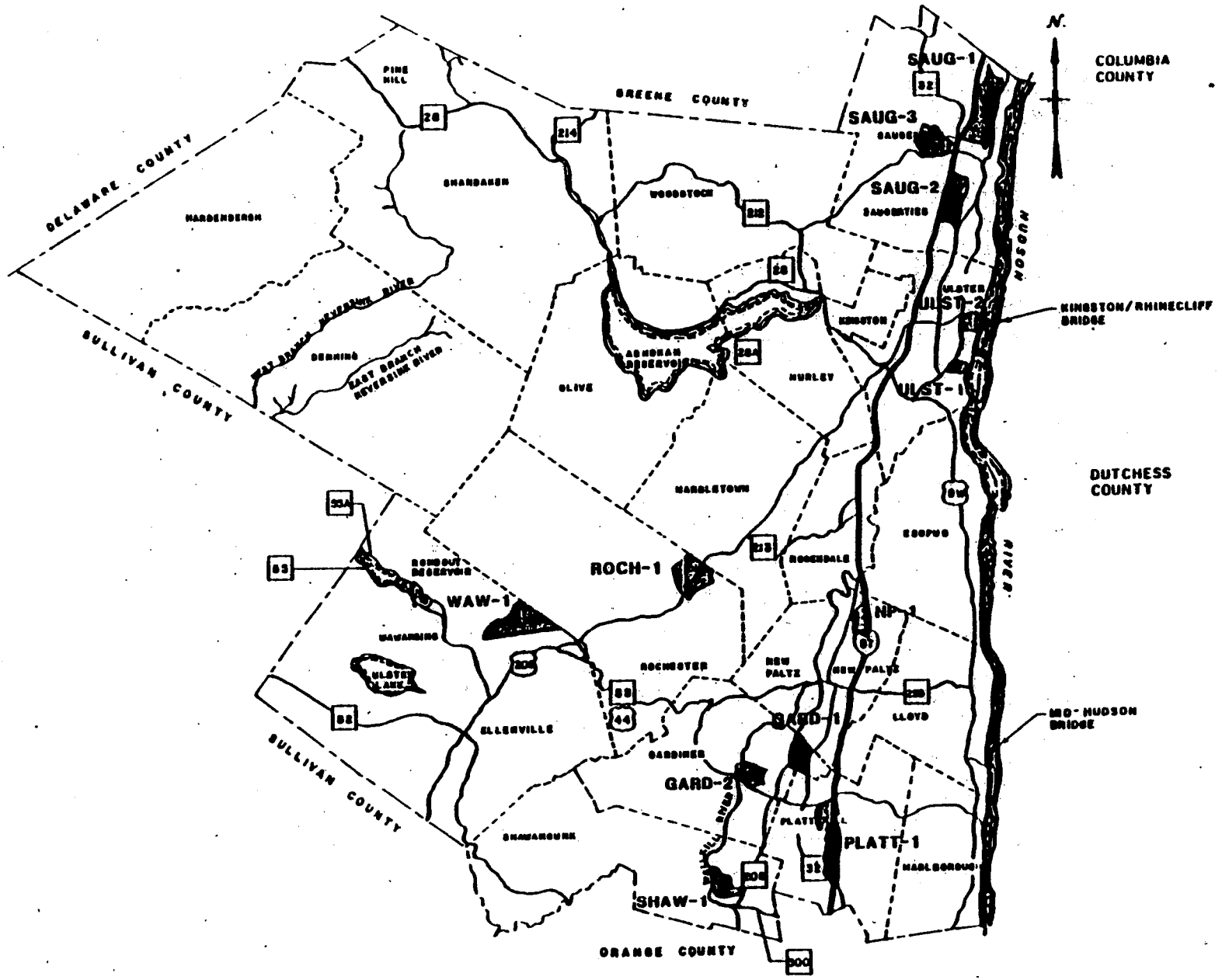


FIGURE 8-1

DGEIS (initia tudy) CANDIDATE AREA

These three candidate areas, ranged in size from 550 to 2200 acres, were larger than necessary for facility development, so area boundaries were redefined to obtain several, smaller sized candidate sites.

PHASE 4. - Site Identification - This analysis included consideration of hydrogeological conditions, wetlands, flood plains, waterbodies, archaeological and historical resources, hazardous waste sites, utility lines, and property ownership. This analysis initially yielded three candidate sites, later, another site was added, resulting in a total of four sites.

PHASE 5 - Site Investigations - These four sites were subjected to further investigations including archaeological/historical surveys, air quality screening, land use surveys, biological site surveys, transportation and accessibility, socio-economics, and hydrogeological investigations. As a result of these investigations, it was concluded that all four sites were suitable for solid waste facility development.

8.3 INTERVENING EVENTS

Prior to completion of the initial siting study, three intervening events occurred:

- The recommendation on disposal technology was made (i.e., landfilling with aggressive reduction, reuse, and recycling);
- 6 NYCRR Part 360 Siting Regulations were finally approved by NYSDEC and became effective in December 1988 - several changes in siting procedures resulted;
- Strong opposition to waste-to-energy was expressed by the County Legislature and members of the public and this technology was no longer under consideration;

Notwithstanding the above events, it was recommended that the siting study in the Draft GEIS was valid. The reasons for this recommendation were:

- That a site appropriate for all technologies would provide UCRRA with maximum flexibility to co-locate a waste-to-energy facility, a recycling materials recovery facility, and landfill in the future. It was recognized that since landfilling with aggressive reduction, reuse, and recycling was the selected technology and waste-to-energy was not selected because of economic reasons and environmental concerns,

landfill factors should be given more weight in the siting analysis. This was done;

- Based upon on-site testing, the soils at the Saugerties site (lacustrine clay deposits) were deemed very favorable for landfill development; and

- It was felt that, based on ongoing discussions with NYSDEC that the siting study procedures were acceptable.

During public comment on the Draft GEIS, NYSDEC and other commentors criticized the initial siting study because it did not emphasize the siting of selected technology (landfilling). In short, NYSDEC did not agree with the "co-location theory". NYSDEC also took the position that under 6 NYCRR Part 360, certain criteria, though appropriate, were applied too early in the process or given greater importance than required by its new regulations. NYSDEC stressed the need to use suitability criteria related to hydrogeologic conditions and recommended a modification of the siting study. NYSDEC questioned whether potential sites more suitable than the recommended site may have been overlooked.

Without conceding the points raised by the NYSDEC, UCRRA agreed to do a supplemental siting analysis, modifying the initial siting study. The supplemental siting analysis was for a landfill only, and was to confirm whether or not the study performed initially resulted in the exclusion of a more appropriate site.

8.4 HISTORICAL DISCUSSION - SUPPLEMENTAL SITING ANALYSIS

The supplemental siting analysis used hydrogeologic criteria specifically applicable to landfill siting (as opposed to the various criteria related to the co-location strategy in the initial study). In the supplemental siting approach, siting criteria was reordered to comply with 6 NYCRR Part 360.

The supplemental siting analysis was based on the New York State Solid Waste Management Facilities regulations, 6 NYCRR Part 360 (Part 360). Differences from the procedure described in the Draft GEIS consisted of several criteria being applied earlier in the process (such as airport buffer area); several being applied later in the process (slope); and the addition of several criteria (wild, scenic, and recreational rivers; agricultural use). The modifications reflected the comments from NYSDEC and from the public. The analysis is described below.

In accordance with the Part 360 regulations, the siting process was initiated using hydrogeologic criteria. The regulations state that preferred landfill sites should be underlain by thick sequences of homogeneous, clay and silt-rich, low permeability material where permeable lenses and channels are unlikely to be present. These geologic conditions would provide an environment which would facilitate monitoring ground water flow and ground water quality and minimize the potential for contaminants to migrate from the landfill in the event of failure.

After conversations with NYSDEC personnel, it was determined that the unconsolidated material in Ulster County, which most closely meets this description, is glaciolacustrine clay and silt (lacustrine clay). Till, which typically contains a high percentage of clay and silt, was determined to be more heterogeneous and more likely to contain coarse lenses which, due to their higher permeability, could provide pathways along which ground water could flow more rapidly. In addition, fractures can sometimes develop in till which would also permit rapid ground water movement.

Lacustrine clay frequently has a high water table, since it is poorly drained and typically occurs in valleys which collect runoff from adjacent highlands. Part 360-2.13(d) states that a minimum separation of five feet must be maintained between the base of the constructed landfill liner system and the seasonal high water table. It also indicates that at sites where the low permeability of the unconsolidated material inhibits drainage, this requirement can be reduced or waived. In addition, drainage systems can be constructed to lower the water table under a landfill. Therefore, it is expected that if a site is selected in a lacustrine clay with a high water table, the site can still be developed.

Part 360 - 2.12(c)(4) states that a landfill must not be constructed where the instability of the underlying material could cause landfill failure. Although lacustrine clay can have associated instability, it can generally be mitigated through various construction techniques. This may result in higher construction costs, but these costs are expected to be offset by the benefits of developing low permeability material.

8.4.1 LACUSTRINE CLAY AND SILT DEPOSITS

The supplemental siting analysis first applied the Surficial Geologic Map of New York (Caldwell, 1987 and 1989) and unpublished field maps (Connolly, 1981 - 1988 and Dineen, 1970 - 1986), to identify general areas of lacustrine clay and silt deposits which were earlier identified in meetings with NYSDEC officials as the soils in the County most closely meeting the criteria of 6 NYCRR Part 360 for homogeneous clay and silty-rich low permeability materials. The areas of non-lacustrine clay were not evaluated further.

8.4.2 Exclusionary Criteria - Exclusionary criteria were then applied to the areas of the County having lacustrine clay deposits. The following criteria established in 6 NYCRR Part 360 were used to exclude certain sections of the County:

- **Primary Water Supply Principal Aquifers [Part 360-2.12(c)(1)(i)]** - Principal aquifers in the County are not mapped and can only be identified through on-site investigations. Therefore, maps of unconsolidated aquifers produced by Kantrowitz and Snavely (1982), Wolcott (1987), Bugliosi et.al.(1988), Frimpter (1972), and Stearns and Wheler (1989) were used to identify and exclude areas underlain by potential principal aquifers. There are no primary water supply aquifers in the County.

- **Wetlands and Waterbodies [Part 360-1.14(c)(4)]** - Areas containing regulated wetlands and waterbodies were excluded from further consideration. NYS Freshwater Wetlands maps (NYSDEC, 1988) and Ulster County Planning Board (UCPB) Wetlands and Waterbodies Map (undated) were used to exclude regulated wetlands and major waterbodies.

- **Floodplain [Part 360-1.14(c)(2) and Part 360-2.12(c)(2)]** - Areas containing 100-year floodplains were excluded from further consideration. Flood Insurance Rate Maps (FEMA, undated) and UCPB Flood Prone Areas Map were used to exclude floodplains.

- **Endangered and Threatened Species Habitat [Part 360-1.14(c)(3)]** - Areas within a 1 1/2 mile radius of an occurrence of any species listed as endangered or threatened were excluded from further consideration. The 1 1/2 mile radius was used since the NYSDEC Natural Heritage Program Database Report identifies the species' occurrence as being 1.5 miles from a given latitude/longitude.

- **Airport Buffer Area [Part 360.2.12(c)(3)]** - Areas within airport buffer areas (less than 5,000 feet from a piston airport; less than 10,000 feet from a turbojet airport) were excluded from further consideration. Data sources included FAA listing, "Active Public and Private Use Airports by State and County" (FAA, 1988); New York Sectional Aeronautical Chart (FAA, 1988); confirmation by local contacts.

- **Agricultural Districts Containing Agricultural Soil Groups 1 or 2 [Part 360-1.14(c)(1)]** - Land may not be taken for a landfill through the exercise of eminent domain if the land is located in a designated agricultural district and consists predominantly of soil groups 1 or 2. Areas

containing such land were excluded from further consideration based on UCPB maps of agricultural districts (various dates prior to September, 1989) and the United States Department of Agriculture (USDA) Soil Survey (1974).

8.4.3 SCREENING CRITERIA

After the exclusionary criteria were applied to the identified lacustrine clay deposits, additional screening criteria were used to identify unsuitable areas and remove them from consideration. Three screening criteria were added at this stage of the analysis because they were considered appropriate and/or because they were consistent with the goals and objectives of the State Environmental Quality Review Act (SEQRA). These criteria were also used in the initial siting analysis and are discussed in detail in DGEIS, Volume I, Section 7.2.

- **Wild, Scenic, and Recreational Rivers [6 NYCRR Part 666]** - Part 666 restricts development of river areas, i.e., within one-half mile of each bank of the river. Areas within one-half mile of a river bank (the mean annual flood level) of a river designated as wild, scenic, or recreational were excluded from further consideration. Designated rivers that are listed in Title 27, Art. 15, ECL, include the Shawangunk Kill from the Orange County line to its confluence with the Wallkill River. FEMA maps were used to determine the river bank on the Shawangunk Kill.

- **Parks and Preserves [6 NYCRR Part 617.1(c)]** states that all agencies should conduct their affairs with an awareness that they are the stewards of the air, water, land, and living resources and that they have an obligation to protect the environment for the use and enjoyment of this and all future generations. Thus, all State and County parks and preserves were excluded from siting consideration in order to promote the preservation of open space. The exclusion of parklands was confirmed as an appropriate exclusionary criterion by the NYSDEC as indicated in their letters of December 15, 1988 and August 21, 1989. Areas within park boundaries indicated on Plate 1 of the Draft GEIS were excluded from further consideration. Application of this criteria is also appropriate because hydrogeologic conditions in the Catskill Park and various parks and trusts in the Shawangunk Mountains will generally not be suitable for landfill development. Glaciolacustrine clay and silt is not mapped on the Surficial Geologic Map of New York (1987, 1989) or the supporting field maps

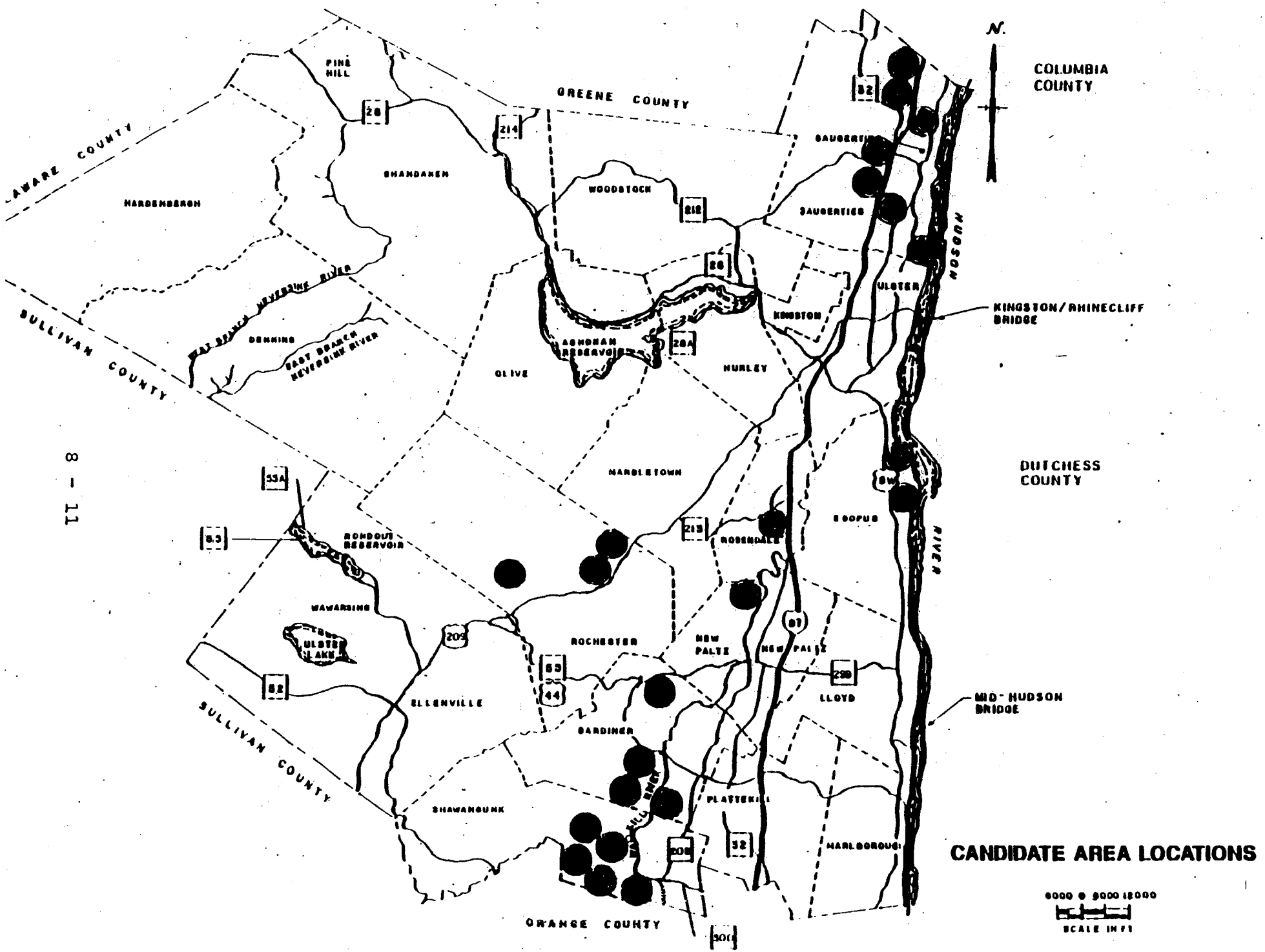
(Connolly, 1981-1988, Dineen, 1970-1986) as occurring in the Catskill or Shawangunk Mountains.

- **Residential and Commercial Development [6 NYCRR Part 360-2.12(e)(1)]** - 6 NYCRR Part 617.1(d) states that human and community resources should be given appropriate weight with social and economic considerations. Accordingly, an objective of this project was to minimize disruption to existing residences and commercial establishments. The exclusion of commercial and residential development was confirmed by the NYSDEC as an appropriate exclusionary criterion for the siting analysis. The areas indicated as developed on Plate 1 of the Draft GEIS were excluded from further consideration.

- **Size** - A 100-acre lacustrine clay area was determined to be the minimum needed in order to meet the County's long term solid waste needs. Analysis of the theoretical minimum acreage required for a generic MSW landfill under 28-52% recycling options indicated that, assuming a square area of clay for the development of the landfill footprint, a minimum of 90 and 60 acres of glaciolacustrine clay respectively, would be required for the landfill footprint. These theoretical minimum acreage are also based on generic type landfills which have no real construction constraints. Therefore, to allow for flexibility in the design of the MSW landfill and potential site constraints which could prevent construction of a square landfill, 100 acre glaciolacustrine clay areas represented a reasonable size for identifying the minimum area required for the landfill footprint. Therefore, areas of lacustrine clay smaller than 100 acres were not evaluated further.

8.4.4 DEFINITION OF CANDIDATE AREAS

The application of the exclusionary criteria and screening criteria to those Sections of the County containing lacustrine clays resulted in the identification of 23 potential candidate areas having at least 100 acres or more of lacustrine clays. Next, boundaries are drawn around potential candidate areas. Area boundaries included roads, utility lines [Part 360-212(e)(4)], railroad lines, rivers, perennial streams, waterbodies [Part 360.1.14(b)(1) and (b)(2)], occurrences of lacustrine clay, and exclusionary criteria. Their locations are shown on Figure 8-2.


N.
COLUMBIA COUNTY
DUTCHESS COUNTY
GREENE COUNTY
ULSTER COUNTY
SULLIVAN COUNTY
SULLIVAN COUNTY
ORANGE COUNTY
DELAWARE COUNTY
HUDSON RIVER
KINGSTON/RHINECLIFF BRIDGE
MID-HUDSON BRIDGE
PINE HILL
HARDENBERGH
SHANDAKEN
WOODSTOCK
SAUGERTIES
ULSTER
KINGSTON
WEST BRANCH NEVERSINK RIVER
DENNING
EAST BRANCH NEVERSINK RIVER
ASHOKAN RESERVOIR
OLIVE
HURLEY
MARBLETOWN
ESOPUS
ROSENDALE
RONDOUT RESERVOIR
WAWARSING
ULSTER LAKE
ROCHESTER
NEW PALTZ
LLOYD
ELLENVILLE
GARDINER
SHAWANGUNK
PLATTEKILL
MARLBOROUGH
CANDIDATE AREA LOCATIONS
SCALE IN FEET

8.5 SUMMARY AND CONCLUSIONS

The initial siting study (in the Draft GEIS) focused on finding a site or sites for co-located facilities and did not emphasize siting criteria most applicable to the selected technology - landfilling. The original siting study used some criteria earlier in the process than provided for in 6 NYCRR Part 360. It also used a numerical matrix to apply preferential criteria and included on-site testing of the preferred sites as the final testing phase.

The modified, supplemental analysis (in Supplemental Draft GEIS) focused on siting a landfill only. It looked at certain areas of the County containing glacial-lacustrine clays. It followed the strictures of 6 NYCRR Part 360 for landfill siting and used a comparative analysis to evaluate candidate areas. No on-site testing was performed, only visual inspection of the candidate areas was done.

For the purposes of this Plan, (see Chapter 9.3.10 of this document for more details) UCRRA determined that:

- The original siting study in the Draft GEIS and the supplemental siting analysis in the Supplemental Draft GEIS, together, provide a firm basis to conclude that all appropriate areas of the County have been reviewed and analyzed for landfill siting purposes; that no superior sites have been overlooked; and

- Based upon a hard look at the original siting study and the supplemental siting analysis, results of these two studies have produced 23 potential candidate areas for landfill development that are reasonable and appropriate.

UCRRA is not prepared to make findings as to the recommended site for site-specific environmental review and permitting pursuant to 6 NYCRR Part 360 at this time. UCRRA believes that on-site testing must be performed on at least two candidate areas before selection of a preferred site. During the public comment period in May 1990, and in subsequent discussions with NYSDEC, several issues were raised which UCRRA considers are in need of further study. These issues include questions on soil stability, hydrogeology of soils, and archaeologic sensitivity of candidate areas.

While lacustrine clay deposits are preferred for landfill siting, they frequently have a high water table and are poorly drained due to low permeability. This raises hydrogeologic issues.

Lacustrine clay has also been identified as having a lower shear strength than glacial tills. While 6 NYCRR Part 360 states that a landfill must not be constructed in an unstable area, it is recommended in the DGEIS and the S-DGEIS that the lacustrine clays on the candidate sites have sufficient strength to support safe development of a landfill. Through documentary review, no other information that would classify the candidate areas as being unstable was adduced.

Based on the above considerations, UCRRA concludes and recommends the following:

- That a supplement to the Final GEIS must be prepared before the action of selecting a preferred site for on-site review and permitting pursuant to SEQRA and 6 NYCRR Part 369;

- That the appropriate procedures for conducting such on-site review is a supplement to the Final GEIS as defined in 6 NYCRR 617.15 (c). This procedure will provide the most significant and meaningful opportunity for public review and comment on the work contemplated;

- That soil stability, hydrogeologic, and archaeologic issues should be reviewed further in on-site testing of at least two candidate areas;

- That the work should be phased so that testing is accomplished in the following order: first, soil stability; second, hydrogeologic conditions; and, third, archaeological conditions;

- Upon completion, the testing will be evaluated to exclude areas not meeting the basic condition for construction of a landfill and to select an appropriate area for site specific review and permitting;

- That the scope of on-site testing will be established after scoping sessions pursuant to 6 NYCRR Part 617.7; and

- That UCRRA shall seek funding for such on-site testing from the County Legislature pending issuance of UCRRA's revenue bonds.

9.0 ULSTER COUNTY'S INTEGRATED (DECENTRALIZED) SOLID WASTE MANAGEMENT SYSTEM

9.0 THE ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN (An Integrated Decentralized System)

9.1 GENERAL

Historically, throughout the State of New York, local governments, namely cities, counties, towns, and villages, have been responsible for municipal solid waste management. These local government units have directly or indirectly collected wastes, transported wastes, acquired land for waste disposal, and constructed and operated solid waste management facilities such as landfills, transfer stations, and recycling centers. Solid waste collection in Ulster County has primarily been the responsibility of the cities, towns, and villages; but now the County is beginning to play a major role with respect to proper solid waste management.

In 1990, approximately 665 tons per day of solid waste was being generated in Ulster County and most of that (about 85%) was being landfilled. Land burial is the primary solid waste management disposal strategy utilized at this time. In order to manage this waste in an economical and environmentally sound manner over the next 25 years, the County has taken the lead by developing a long range comprehensive solid waste management plan (the "Plan"). "The Plan" for the County incorporates waste reduction, a comprehensive recycling/composting program, and a state-of-the-art landfill. This combination provides an integrated approach that effectively addresses environmental, technical, and economic considerations.

The Ulster County integrated solid waste management planning process officially began on February 17, 1988 when the Ulster County Legislature authorized the Ulster County Resource Recovery Agency ("UCRRA") to become the lead agency and to prepare a Solid Waste Management Plan/Generic Environmental Impact Statement pursuant to the NYS Solid Waste Management Act of 1988, the 6 NYCRR Part 360-15 regulations and the State Environmental Quality Review Act. After 2 1/2 years of research , analysis, field investigations, documentation, data collection, and evaluations (see Chapters 1.0 through 8.0 of this document), UCRRA developed a comprehensive understanding of the solid waste management problems and solutions for them. Upon careful evaluation of the alternatives and a complete assessment of technological options (see Chapters 5.0, 6.0, and 7.0 of this document), the UCRRA in September of 1990 prepared its Findings Statement and "The Plan", elements

of which are fully discussed in this chapter. UCRRA also evaluated generic environmental impacts associated with "The Plan" and mitigation measures for those impacts (see Chapter 10.0 of this document).

County residents and local government officials have had numerous opportunities to become involved and to comment on the solid waste project before it developed to this point (see Chapter 11.0 of this document). The UCRRA seriously considered all public input and incorporated many of the public's suggestions into its findings, final plan, and implementation strategies. Opportunities for public participation will continue to be made available in the form of public hearings, scoping meetings, informational meetings, Citizens' Advisory groups, etc. as various components of "The Plan" are implemented.

This section details all aspects of the proposed Ulster County Solid Waste Management Plan including goals and objectives, component actions, recommended facilities, implementation strategies, program cost estimates, and implementation schedules. Facility siting methodologies are considered in Chapter 8.0 of this document.

9.2 GOALS, OBJECTIVES, AND FINDINGS

The overall goal of the Solid Waste Management Plan is to provide an environmentally sound and cost effective solution to the problems associated with the collection, transportation, processing, and disposal of municipal solid wastes generated in the County. "The Plan" covers a 25 year planning period from 1989-2014. A 5-year interim period from 1989-1994 is necessary for the planning, design, siting, and construction of the various solid waste management facilities called for. These facilities are expected to be fully operational during their 20-year life, 1994-2014. Some may be functional beyond this time frame. The primary objectives considered by UCRRA in preparing "The Plan" are:

- To provide a solution that makes the most sense, both environmentally, socially, and economically;
- To provide a solution that is capable of serving Ulster County for at least the next 20 years, possibly longer;
- To provide a solution that maximizes to the extent economically and technically practical, Waste Reduction, Recycling, and Reuse of all components of the waste stream;

- To provide a solution that ensures that materials, such as household hazardous waste, are removed from the waste stream reducing the toxicity of the waste generated;

- To provide a solution that ensures that all components of the waste stream are managed including sludge, construction & demolition debris, medical waste, and apple and grape pomace;

- To provide sufficient new landfill capacity necessary for the disposal of the County's waste stream during the interim phase of "The Plan", and for the disposal of bypass and unprocessible wastes resulting from the operation of component facilities during the long-term phase;

- To provide a solution that complies with the NYS Solid Waste Management Act of 1988, the State's Solid Waste Management Plan, 6 NYCRR Part 360 regulations, and other related local, state, and federal regulations; and

- To provide a solution that addresses the historic, current, and future solid waste management problems experienced by the planning unit.

In an effort to meet these objectives, UCRRA has prepared a detailed set of Findings (Findings Statement (FS), September, 1990) which outlines the specific actions the County Legislature and the UCRRA must take in order to have an "Approved Plan" so that UCRRA can begin implementing the programs. It is UCRRA's recommendation that actions be taken in the following six areas:

1) The UCRRA and the County Legislature approve and authorize an integrated solid waste management plan for the County (FS, 1.0);

2) An aggressive Countywide waste reduction, reuse, and recycling and yard waste composting program be established and implemented immediately (FS, 2.0);

3) A single new Countywide landfill be considered as the primary solid waste disposal strategy (FS, 3.0);

4) The UCRRA be authorized to site a Countywide landfill disposal facility (FS, 4.0);

5) The UCRRA be authorized to develop a host community program in municipalities where County solid waste facilities are located (FS, 5.0);

6) A method for amending "The Plan" and implementing future actions be established (FS, 6.0).

These findings are based on the studies prepared under the SEQRA process and set forth in the Draft and Final GEIS and the Supplemental Draft and Supplemental Final GEIS (collectively, the "SEQRA Documents"). These findings not only outline the actions to be taken by the County, but are also in compliance with the "New York State Solid Waste Management Act of 1988".

With this "Plan", Ulster County sets itself firmly on the road towards a future quite different from the present. Twenty-five years from now people will be throwing away much less than they did in 1989. They will be purchasing more durable products rather than disposable products. Recycling will have become a way of life. Most homes will have only one waste can, but every room will have its own household recycling container. Many homes will have a compost bin in the backyard and a special food waste container in the kitchen. Recycling will be an active business with firms competing for the large variety and volumes of recyclable materials. Household hazardous waste will be virtually none existent. What there is may be taken directly back to the manufacturer or safely disposed of at a local household hazardous waste storage facility.

In the year 2014, so much material will be recycled or reused that relatively little will be left over and called "waste". The remaining waste will be transported to the County State-of-the-Art landfill where it will be safely buried. All old local landfill sites will have been closed and carefully monitored. The engineered closures were so successful that there is no evidence of air or water pollution.

After 20 years of steadily learning how to reduce and reuse more and more of their wastes, the residents of Ulster County are proud of what they have accomplished.

9.3 COMPONENT ACTIONS

After an extensive evaluation of the alternatives (Chapters 5.0, 6.0, and 7.0 of this document) and a determination to meet the goals and objectives of the waste management planning efforts, the County has developed a comprehensive Solid Waste Management Plan based on an integrated system of component actions and a decentralized system of solid waste management facilities (i.e. Recycling Centers, Compost Facility, Transfer Stations, Landfill, etc.).

In keeping with State policy on solid waste management, the County plan embraces the major elements of the solid waste management planning hierarchy and appropriately designates waste reduction and recycling (including composting) as the cornerstone of "The Plan". The major program components of the Ulster County "Plan" are as follows:

- **Waste Reduction/Reuse through legislation and education**

- **Household Hazardous Waste - separation, collection, and reuse or disposal programs**

- **Recycling - Satellite Aggregation Center System (SAC) - for major materials recycling identified in the Intermunicipal Agreements (IMAs) with Ulster County municipalities**

  - **Recycling - miscellaneous materials recycling program for materials not identified in the IMAs (ie. textiles, batteries, tires, appliances, etc.)**

  - **Recycling - Legislative Educational and Institutional programs**

  - **Facilitate a construction and demolition debris recycling and volume reduction program**

  - **Municipal Organic Waste Composting and Diversion programs to include:**

    - **Municipal Yard Waste Composting program**
    - **Sewage Sludge Management program**
    - **Food Waste Diversion program**
    - **Apple/Grape Pomace Reuse/Composting program**
    - **Offal Reuse and Diversion program**

  - **Municipal Solid Waste (MSW) processing assessment**

  - **Facilitate a medical waste management program**

  - **Landfilling/Transfer Station System for disposal of residuals (after recycling and organic waste composting) and by pass wastes in a single, new capacity, state-of-the-art landfill**

Consideration had been given to the technological, environmental, and economic aspects associated with the waste-to-energy incineration of municipal solid waste. However, the UCRRA, with input from the Citizen's Advisory Committee (CAC), solid waste planning consultants, County Legislature, and the public, determined that the waste-to-energy alternative was not suitable for Ulster County because of economic reasons and environmental concerns. As discussed in this section, importing solid waste would help make a Waste-to-Energy facility more economically feasible. However, importation of solid waste from outside the County would create additional adverse environmental impacts and is clearly against the solid waste management policies as described in "The Plan". Given the above concerns, landfilling is more economically feasibly since solid waste importation is not acceptable to the County. The UCRRA further determined that a non-burn solid waste management program that maximizes waste reduction and recycling to the extent technically and economically practical is preferable. One exception recognized by UCRRA is related to the incineration of regulated medical wastes (ie. red bag wastes).

Presently, incineration of regulated medical waste is recognized as a common practice and the only legal method. UCRRA intends to review this method to determine if there are more suitable options.

These basic solid waste management strategies will successfully manage the approximately 665 average tons per day of solid waste currently generated, and the 829 average tons per day expected to be generated by the end of the planning period (2014). Figures 9-1a through 9-1d shows the waste flow components of "The Plan" for the years:

- **1990-(Figure 9-1a)** - Beginning of the Interim Planning Period

- **1994-(Figure 9-1b)** - End of the Interim Planning Period

- **1997-(Figure 9-1c)** - The Year New York State has set to achieve its Recycling Goals;

- **2014-(Figure 9-1d)** - The Last Year in the Planning Period

These diagrams illustrate the approximate tonnage of solid waste to be allocated towards the various plan components. Each allocation effectively reduces the total waste stream. For example, in the year 1997 after maximum allocation towards waste reduction, recycling, and composting, approximately 50-60% of the County's waste stream will remain. These remaining mixed waste will be landfilled until such time as other programs are in place and higher percentages of recycling can be achieved.

Interim programs for managing various types of waste within the planning unit are described throughout this section (Section 9.0). All interim programs occur during the 1990-1994 time frame. After which all facilities are expected to be constructed and in operation. The program implementation schedules found in this section outline the interim programs the UCRRA will implement between 1990-1994. Basically these interim activities will consist of:

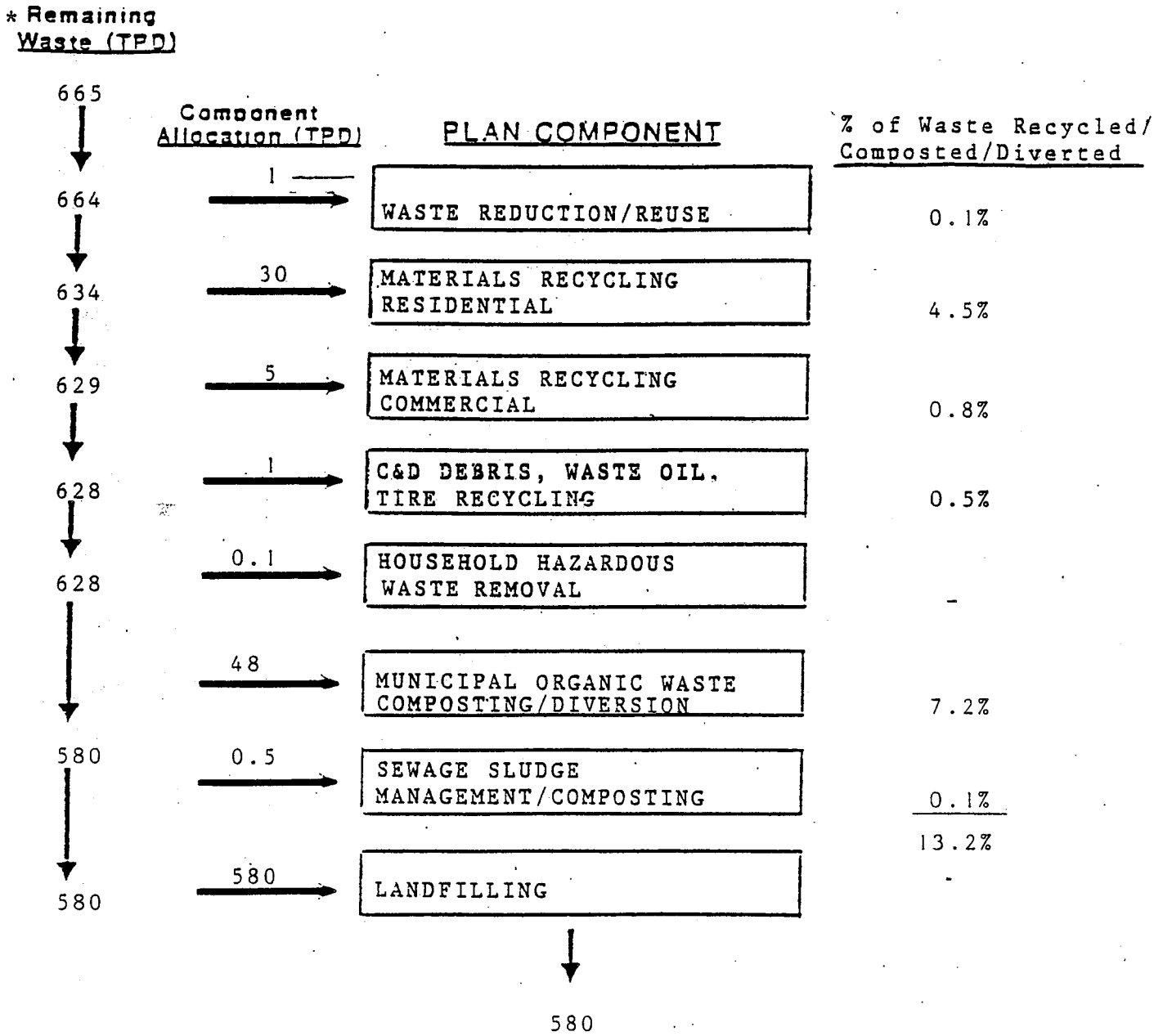
- Siting solid waste management facilities;
- Securing funding for all programs;
- Facilities' design, permit, and construction;
- Equipment purchases;
- Implementing Solid Waste Management Legislation;
- Research; and
- Implementing public solid waste educational programs.

The following sub-sections describe in detail the actions, strategies, and schedules that must be adhered to in order to implement "The Plan" in an integrated fashion.

FIGURE 9-1a

ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN
WASTE FLOW/PLAN COMPONENT DIAGRAM

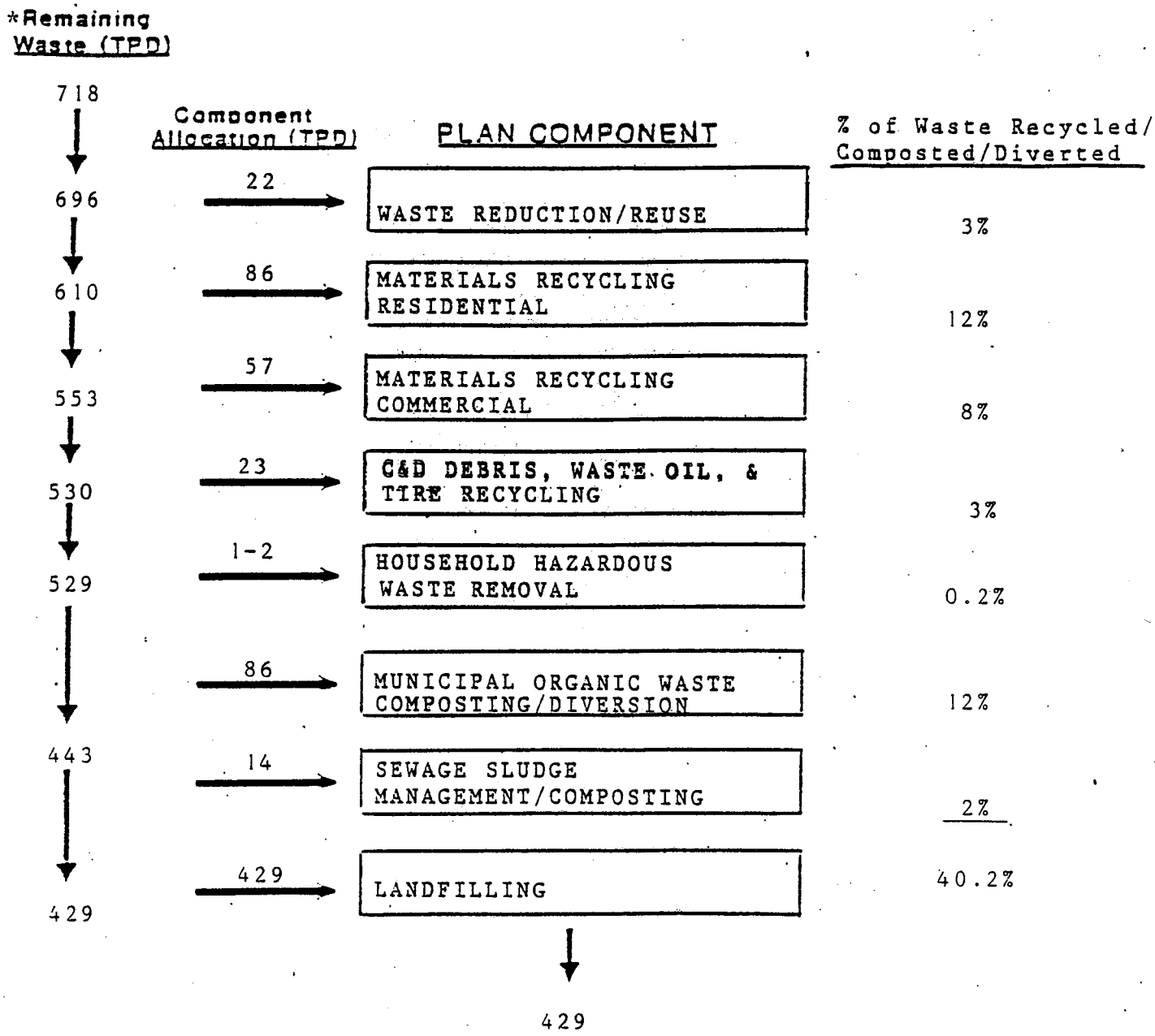
YEAR - 1990



* Remaining Waste TPD After Returnable Bottle Law Reduction

FIGURE 9-1b

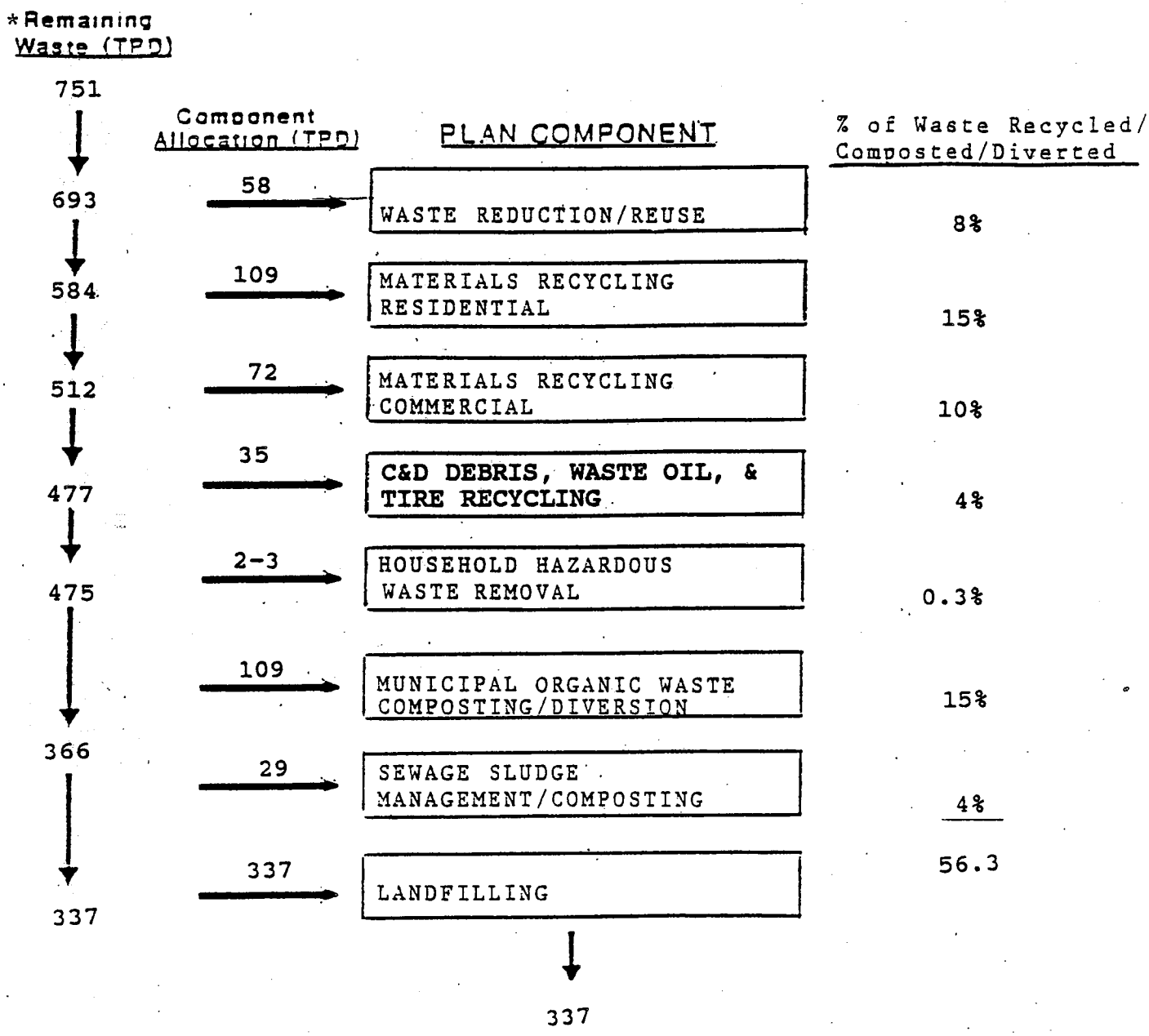
ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN
WASTE FLOW/PLAN COMPONENT DIAGRAM
YEAR - 1994



* Remaining Waste TPD After Returnable Bottle Law Reduction

FIGURE 9-1c

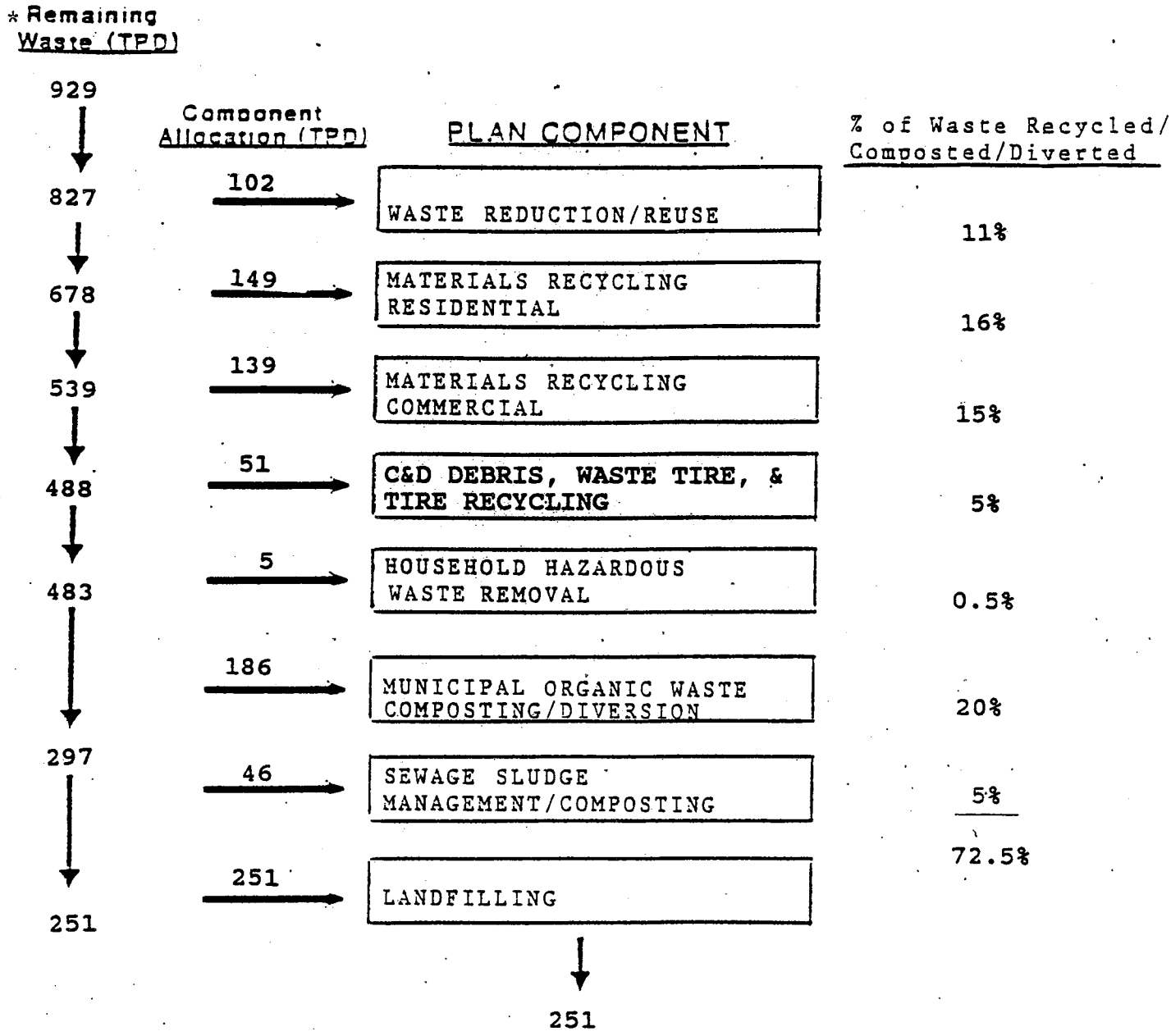
ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN
WASTE FLOW/PLAN COMPONENT DIAGRAM
YEAR - 1997



* Remaining Waste TPD After Returnable Bottle Law Reduction

FIGURE 9-1d

ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN
WASTE FLOW/PLAN COMPONENT DIAGRAM
YEAR - 2014



* Remaining Waste TPD After Returnable Bottle Law Reduction

9.3.1 WASTE REDUCTION/REUSE PROGRAM

Waste reduction is defined as minimizing actions that generate waste materials which must be recycled or disposed of. In its findings (Findings Statement 2.2.4), UCRRA determined that waste reduction is a preferred waste management method and seeks to maximize its waste reduction efforts. The State Plan establishes a goal of 8-10% reduction in waste generation by 1997. This will be achieved primarily through state action. UCRRA recognizes that local and state legislation coupled with extensive education and information programs are the most effective means for achieving the waste reduction goal.

Any one individual effort to reduce waste may only result in a minor reduction. But, if many people and businesses were to initiate waste saving activities, the cumulative effect would be significant. The role of the government in waste reduction is to stimulate these actions by the public and to implement waste reduction measures in its own actions. To meet these goals, UCRRA will purpose and recommend the following legislative actions to be taken:

Federal and State Legislative Support - The County should support state initiations aimed at reducing wastes and encouraging recycling. This includes support for pending bills aimed at developing recycling markets, bottle deposit legislation, economic incentives for recycling manufacturing facilities, restrictions on the production of certain types of packaging materials, and establishment of waste reduction policy.

Regional Packaging Legislation - UCRRA also supports the review by local government of local or regional packaging legislation. UCRRA finds and determines that the County should continue to participate in the Mid-Hudson Regional Packaging Task Force. It finds and determines that such legislation should be approved only after full compliance with environmental laws and that such legislation should be adopted in a way that meets constitutional and statutory requirements.

Local Legislation Initiatives - Legislative Action at the County level should be used to promote waste reduction at its source. Selecting the appropriate legislation depends on the target group and the desired results. Legislative measures will fall into three general categories: policy declarations, incentives and disincentives. County legislative resolutions can define the waste reduction policy. Direct regulation, such as bans on specific materials or deposit laws can be used. Alternatively, the County can use its spending and taxing powers to influence waste generation.

Examples of these measures include: disposal surcharges at the landfill, taxing waste generation activities, tax credit/exemptions for waste reduction efforts and new government guidelines.

The County should also consider developing County legislation similar to the agreement between New York Newspaper Publishers and the New York State Department of Economic Development requiring newspaper publishers to use 40% recycled newsprint by the year 2000.

UCRRA also recommends that the County review and support Federal and State initiatives in these subjects through the adoption of memorializing resolutions, through communication with Federal and State representatives, and through the development of information relating to local experience. UCRRA should also, though its educational programs, encourage the public to support Federal and State initiatives.

While the passage of the above initiatives would be expected to achieve positive waste reduction results, they are likely to be ineffective unless extensive public education and information programs are implemented concurrently. The UCRRA, therefore, recommends that public education programs accompany all aspects of the proposed "Plan" and, in particular, local waste reduction education initiatives focus on the consumer, business/manufacturing, and local government officials. These initiatives shall include, but not be limited to the following:

Residential/Consumer Education - UCRRA shall design and implement an educational program for County residents, visitors, and tourists that will assist these consumers to at a minimum:

- Select durable items when purchasing clothes, appliances, etc. that may cost a little more, but have a longer life;

- Purchase reusable rather than disposable items such as razors, dishes, etc;

- Select products that have one layer of packaging rather than two or three, such as a deodorant can in a box wrapped with plastic;

- Buy concentrate or bulk "economy-size" items;

- Repair rather than throw away broken or worn appliances, shoes, clothing, etc.;

- Donate used items to needy organizations;

- Reuse cardboard boxes, glass containers, and plastic bags; and

- Unclog drains with snakes and plungers instead of chemical drain de-cloggers.

Business/Manufacturing Education - UCRRA will design and implement an educational program for County businesses that will, at a minimum, encourage the following waste reduction methods:

- Paper comprises 70% of the average office waste stream. This can be reduced through numerous cost saving measures such as, copying double-sided, central rather than multiple filing, using scrap paper for messages, etc.;

- Purchase refurbished used equipment or rebuild old equipment already owned;

- Implement a conscientious waste quantity control program by using more efficient equipment, employee training, and better quality management to reduce rejects;

- Join "waste exchanges" programs;

- Use sturdy, reusable pallets and shipping containers;

- Often, toxic waste can be salvaged in-house for reuse at less cost than expensive toxic waste disposal;

- Use cloth rags often supplied by linen services for cleaning machinery and products; and

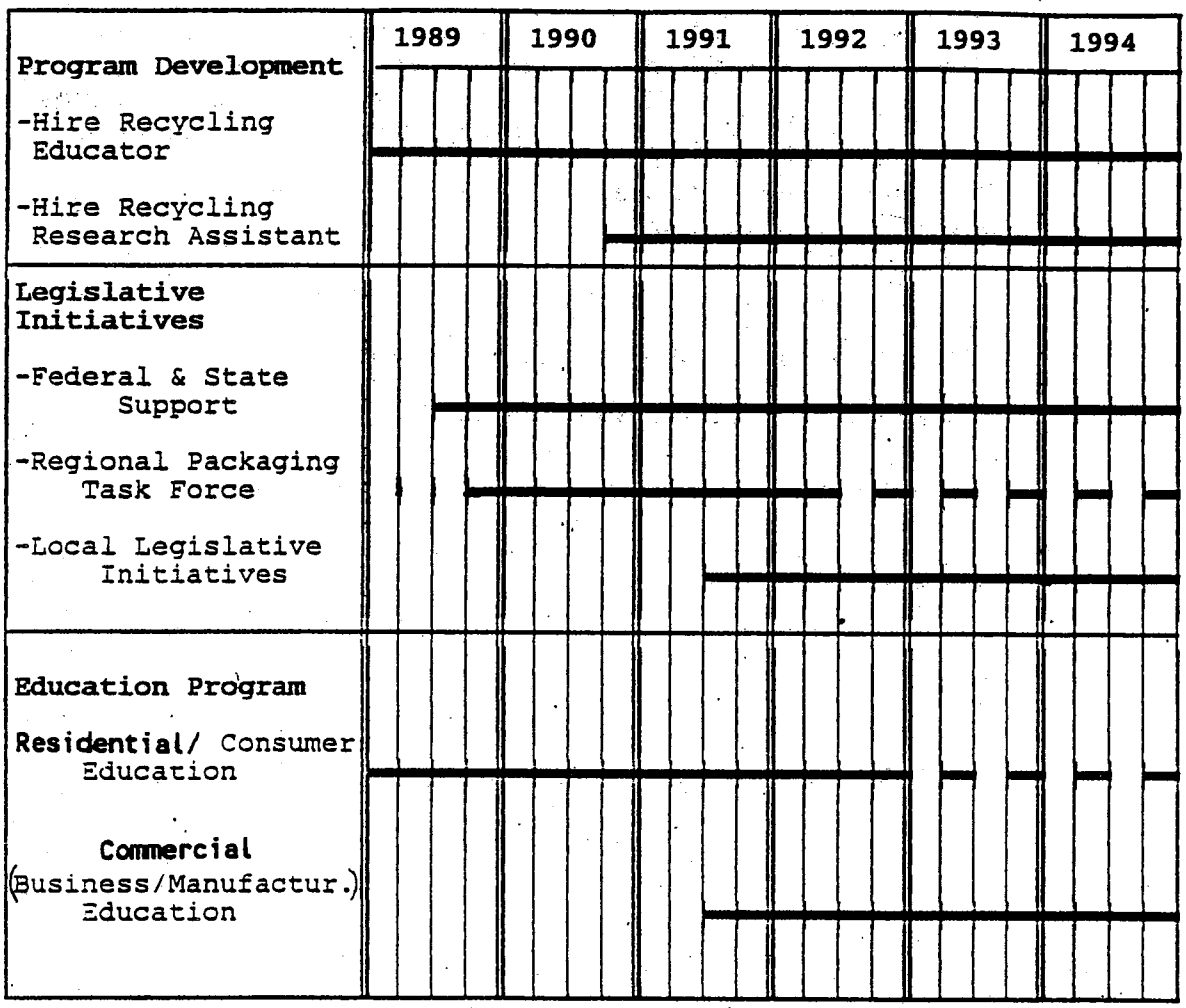
- Commercial waste recycling audits businesses to assist owners and employees to define their waste stream and identify business specific waste reduction steps that can be taken.

Special Activities - The UCRRA will also provide recommendations to the County Legislature that address waste reduction and market support for recycled materials such as preferential purchasing policies that encourage the use of materials with recyclable content.

The UCRRA has hired a Recycling Coordinator/Educator and a Recycling Research Assistant who have the responsibility for designing and implementing a comprehensive waste reduction education program. As the

County begins to implement its waste reduction education and legislative program new ideas, demonstration projects, and activities will emerge. These will be incorporated into the program over time. As the program is implemented according to the implementation schedule outlined below, Ulster County should realize a 4% reduction in waste generation by 1994 and an 8-10% reduction by 1997.

WASTE REDUCTION/REUSE PROGRAM
IMPLEMENTATION SCHEDULE (1989-1994)



9.3.2 HOUSEHOLD HAZARDOUS WASTE (HHW) REMOVAL PROGRAM

Ulster County currently generates about 0.5 tons per day of what are commonly called household hazardous wastes (HHW); also known as household toxics. While representing a negligible percentage of the total waste stream (less than 0.1%) in terms of volume, their potential toxicity may pose a significant threat to the environment, and to public health and safety. HHW include, but are not limited to, unused:

Paints and thinners	Drain cleaners
Solvents	Fertilizers
Oil	Cleaning Agents
Polishes	Antifreeze
Pesticides	Wood Preservatives
Aerosol cans	Degreasers

Currently there is no comprehensive, Countywide program for segregation, collection, and disposal of HHW. On June 9, 1990, the Ulster County Environmental Management Council (EMC) sponsored a very successful HHW clean-up day. This one day event was viewed as a pilot effort and after evaluation, a recommendation that a long-term, permanent HHW collection program should be implemented.

UCRRA has accepted the responsibility for managing household hazardous waste (HHW) and will implement a HHW collection program that would be coordinated with Ulster County municipalities. The development program should be a cooperative venture between UCRRA and the EMC and should be phased in over time. To meet this goal and to have a permanent HHW removal program in full operation by 1994, UCRRA will implement the following actions:

A HHW Public Education Program - Will be put into effect immediately and in conjunction with the waste reduction education program outlined in section 9.3.1. This program should at a minimum:

- Educate the public as to the types of materials which comprise HHW and in proper handling and disposal methods;
- Emphasize the purchase of non-hazardous products;
- Encourage the reuse, exchange, and recycling of materials to disposal; and
- Train and educate operators of solid waste management facilities to identify and remove any suspected hazardous wastes or unacceptable materials during operation of the solid waste management facilities. These materials may be segregated, sorted on-site in a secure manner, and ultimately disposed of at a permitted hazardous disposal facility.

UCRRA Through Board Authorization - will undertake an evaluation of alternatives for a permanent HHW collection, storage, reuse, and disposal system. This evaluation should be initiated in the spring/summer of 1991 and study at a minimum:

- The types and quantities of HHW to be included in the program;

- The advantages and disadvantages of the various alternatives which include:

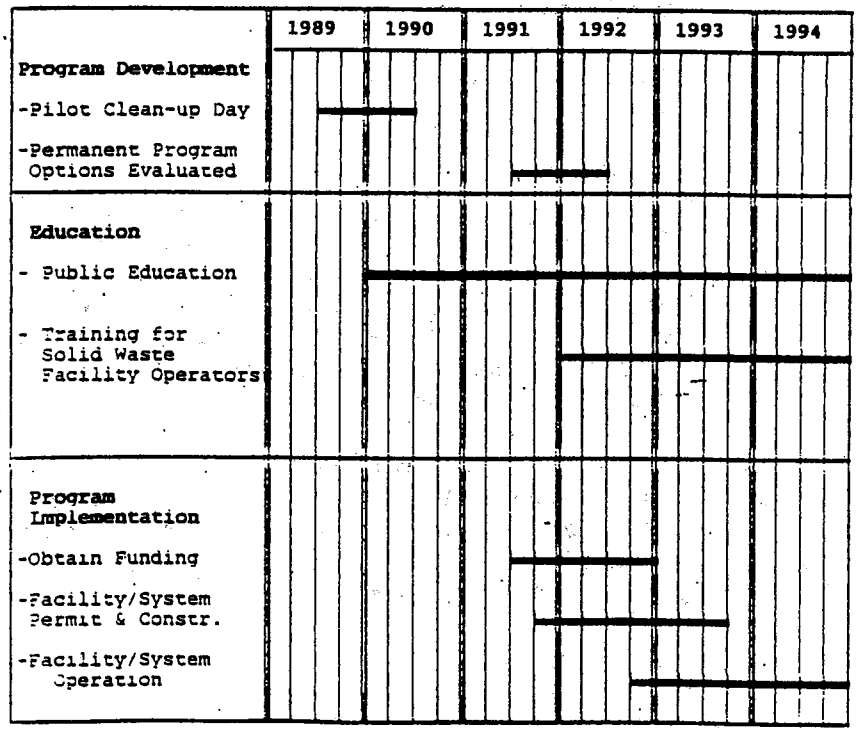
  (1) Establishment of regional permanent permitted HHW collection and storage facility;
  (2) Local permitted storage facilities and/or mobile collection units that make scheduled timely pick-ups by NYSDEC licensed haulers;
  (3) Curbside collection system for HHW; and
  (4) Combination of the above or other

- A cost/benefit analysis of the various options

UCRRA Upon Selecting the Most Appropriate Option - for a permanent HHW collection and storage system, should implement that option in phases starting in the fall of 1991 with the goal of having the system in full operation by the end of 1993.

UCRRA Will Seek the Necessary Funds - to develop, implement, and carry-out the permanent HHW collection, storage, and reuse and disposal program. As the permanent HHW collection/disposal system is implemented, according to the schedule outlined below, the County will begin to realize a number of benefits that are associated with the program. Benefits include safer operation and reduced environmental impacts associated with solid waste management facilities such as landfills and compost operations. As a result, the potential costs associated with environmental impacts (such as leachate generation, treatment, and disposal as well as air emissions and residue disposal) will be reduced since many of the materials that involve sophisticated and costly treatment and disposal would be removed from the waste stream. As is the case for other components of the Ulster County Solid Waste Plan, the success of the County HHW removal program hinges on the degree of public participation which may be augmented by public education and information programs.

HOUSEHOLD HAZARDOUS WASTE (HHW) REMOVAL PROGRAM IMPLEMENTATION SCHEDULE 1989-1994



9.3.3 RECYCLING - SATELLITE AGGREGATION CENTER (SAC) SYSTEM

As stated earlier, a major goal of this "Plan" is to ensure that reduction and recycling/reuse are the cornerstone and major focus of the County's integrated solid waste management strategy. This section summarizes the findings, conclusions, recommendations, and actions to be taken by the UCRRA in establishing a major materials recycling program in cooperation with Ulster County municipalities. A full detailed discussion and supporting data outlining the need and basis for the Satellite Aggregation Center (SAC) System can be found in:

- **Findings Statement, Section 2.0 (Establish a Countywide Reduction, Reuse, and Recycling Program);**
- **Section 2.3 of this document (Existing Recycling Practices and Facilities);**
- **Chapter 3.0 of this document (Solid Waste Quantities and Characteristics);**
- **Chapter 4.0 of this document (analysis of Recycling Markets and Materials);**
- **DGEIS, Volume IV, Recycling Action Plan (RAP);**
- **FGEIS (Response Document), Section III.**

Prior to making its decision to develop the SAC System as the management strategy for recycling, the UCRRA conducted a full evaluation of the alternatives to the SAC System. This evaluation can be found in the DGEIS, Volume IV (RAP), Section 5.0, pages 5-1 through 5-15.

Major materials recycling generally refers to those waste materials that can be readily separated from the waste stream and placed in individual containers for collection or drop-off. Newspaper, glass containers, metal cans, plastic containers, office paper, and corrugated cardboard are included in the category of materials recycling. Usually excluded from discussions of major materials recycling are other potentially recyclable products that are not commonly or frequently generated in the home and are not easily segregated and collected in separate containers by homeowners. These materials may include construction and demolition (C&D) debris, yard waste (grass,leaves,brush), food and organic wastes, tires, and textiles among others. Specific recycling schemes are employed to handle these types of materials, but are usually not referred to under the heading of major materials recycling.

The Comprehensive Recycling Analysis (found in Chapters 2.0, 3.0, 4.0, and 12.0 of this document and DGEIS, Volume IV (RAP) establishes the need for recycling in the County and identifies the amounts of recyclable materials found in the waste stream. It points out that the development of recycling is an integral component of the County's Solid Waste Management Plan and will be dependent upon market conditions, participation levels, and economic considerations. It also provides for the establishment of countywide comprehensive reduction,

reuse, and recycling programs geared to meeting and exceeding the State goal to reduce the solid waste stream by 50% through reduction and recycling by 1997.

UCRRA has determined that the best strategy for implementing a major materials recycling program is through the establishment of a Countywide Satellite Aggregation Center (SAC) System. Under the SAC System, the County would provide collecting equipment, transportation, processing, marketing services, and other services for the municipalities who elect to participate. The municipalities would be responsible for the setting up of localized Municipal Recycling Drop-Off Sites (MRDS) and ensuring that recyclables collected at the MRDS be included in the system in a condition suitable for marketing. Other specific responsibilities of both the Agency and participating municipalities are spelled out under the terms of the Intermunicipal Agreements (IMA) signed by both parties.

UCRRA has also determined that a Countywide SAC System be implemented in phases, thereby providing a basis for measuring its impact and identifying the specific activities that should be implemented in future phases. A phased approach also serves to ensure maximum public participation and program efficiency. Following are the recommendations and actions to be taken for the development of Countywide SAC System.

Phase 1 - Technical Assistance - UCRRA will provide technical assistance to the existing municipal recycling activities and programs. Such assistance should include information on markets for materials, coordination of collection procedures, technical support on negotiating contracts with markets, directions on public awareness and education programs, and obtaining grants from NYSDEC for recycling. This phase of implementation has been underway since early 1988.

As part of its technical assistance program, UCRRA will provide professional consultation services through its Recycling Coordinator/Educator and recycling operations staff. UCRRA has also used the services of Resource Integration Systems, Inc. (RIS), a firm with expertise in reduction, reuse, and recycling, and composting programs. UCRRA will encourage local governments to fund positions for recycling coordinators and other personnel. UCRRA has established a Municipal Recycling Coordinators' (MRC) Roundtable, which serves as a coordinating council consisting of representatives of the recycling departments in each of the County's 24 municipalities. The MRCs meet on a regular basis

and provides for effective communication and coordination of recycling programs within the County. This MRC Roundtable should continue. Technical assistance will be available to any municipality requesting it. UCRRA will continue to develop its technical assistance program and maximize funding available from the State government for such purpose.

Phase 2 - Recycling Development Projects - In this phase, the UCRRA instituted two development projects: a Countywide single materials project for newspaper, and a single location multi-material project. During 1988, the UCRRA implemented these development projects. An RFP was developed and issued, which resulted in the selection of Ulster County Sanitation, Inc. as the private sector vendor who provided the marketing and transporting services. The Town of Ulster was selected as the municipality in which the single location, multi-material program would be undertaken. Approximately 16 other municipalities and the State University of New York at New Paltz became partners with UCRRA in the Countywide newspaper development project. The newspaper development project ended December 31, 1990.

The development projects were evaluated and what was learned was applied to implementation of the SAC System. A more detailed discussion of the development projects can be found in Section 2.3.2 of this document.

Phase 3 - Satellite Aggregation Center (SAC) System - In the third phase of implementation, the County replaced the development projects with the SAC System. Planning for this phase began in December of 1989 through August of 1990 when 22 of the County's 24 municipalities signed the IMAs and became participants with UCRRA. Implementing the SAC System began in September 1990 with the distribution of recycling roll-off collection containers to participating municipalities and is expected to continue through 1993 after which Phase 4 - Long-term program will go into effect. The key activities for this phase include:

- The development of intermediate processing capabilities at two Agency owned and operated Satellite Aggregation Centers;

- Establish a transportation network using Agency owned and operated hauling equipment to facilitate moving recyclable materials from the Town MRDS to the Agency's SAC and ultimately to market;

- To improve the marketability of the recyclable materials.

The SAC System should include the establishment of MRDS in each of the participating municipalities. The system should also provide that municipalities be responsible for collecting separated materials in a condition acceptable to UCRRA and the haulers be responsible for transporting the materials they collect to the MRDS and depositing it in the Agency's roll-offs or transporting it to the SACs. Collection methods shall be the responsibility of the private hauler or the Municipality. Materials to be recycled initially shall include newspaper, color-separated glass, old corrugated cardboard containers, office paper, plastic containers, tin, and aluminum cans.

Other materials may be added after mutual agreement by the Agency and the participating municipalities. In order to accomplish this, the Agency plans and recommends that, at a minimum, the following activities be undertaken:

Intermunicipal Agreements - UCRRA will formally negotiate Intermunicipal Agreements (IMAs) with all municipalities wishing to participate in the County SAC program and will establish performance standards and definitions of materials to be source separated and recycled.

Performance Standards - UCRRA, in cooperation with participating municipalities, will design a set of Performance Standards according to market specifications that will maximize revenues and reduce processing and transportation costs.

SAC Permitting and Construction - UCRRA has undertaken a study to locate the SACs, and finds that two SACs, to serve the southern and northern parts of the County respectively, should be developed. UCRRA further finds and determines the municipally-owned area near the municipal landfill and recycling operations in the Town of New Paltz and the area near the municipal transfer station in the City of Kingston, as depicted on preliminary site plans on file at UCRRA offices (Weston, 1990), are the preferred locations for the SACs. The next steps in developing the SAC System will be to:

- Negotiate SAC implementation with the town host communities;

- Prepare SAC permit applications based on the design of the facilities; and

- Undertake site specific and program specific SEQRA reviews which will lead to the construction and operation of the SACs.

Markets - UCRRA will, through authorization and release of expressions of interest, explore and develop a market strategy for recyclables to be processed at the SACs. Request for

expressions of interest should be sent to identified markets. UCRRA will strive to obtain firm market commitments for at least two years.

Municipal Recycling Drop-Off Sites (MRDS) - Municipalities participating in the SAC System will be required to expand and develop their Municipal Recycling Drop-Off Sites (MRDS). Many of these municipal operations will be incorporated into the UCRRA's plan during the expansion and long-term phases of the Countywide recycling program. UCRRA will provide technical assistance in this area for municipalities who request it.

Recycling Equipment and Transportation - During the interim expansion phase 1990-1992, the UCRRA:

- will provide for processing and marketing through a contract with a vendor(s) and by purchasing equipment for operating the SAC System;

- will purchase individual Household Collection Containers and make them available to municipalities for homes that receive curbside multi-material collection service and for residents who utilize local MRDS, basically one for every residence in the County; and

- will purchase the rolling stock (roll-off trucks, tractors, roll-offs, etc.) necessary to establish its intra-county recycling transportation network. UCRRA may also contract for the transportation and sale of recyclable materials. Arrangements should be made to have recyclables transported from Municipal Recycling Drop-Off Sites (MRDS) to the County's Satellite Aggregation Centers (SACs) for processing and ultimately to markets for sale.

Technical Assistance - The UCRRA will continue to provide technical assistance to the existing municipal programs in the form of providing centralized market arrangements, grant application assistance, recommendations for MRDS improvements, and other assistance identified as needed.

Education - UCRRA will design and implement an education program designed to inform residents, businesses, local governments, haulers, and others regarding their responsibilities in meeting the goals and objectives of the SAC System. For a detailed discussion of recommended educational initiatives, see Section 9.3.5 below.

Legislative Measures - Legislative measures must be implemented to ensure that the Agency remains viable and competitive and retains control of the recyclable waste stream. Such measures may include County adoption of "Flow Control Legislation" and/or Mandatory Recycling Legislation. For a more detailed discussion of the recommended legislation initiatives, see Section 9.3.5 below.

Existing Programs - The private sector programs, including voluntary and commercial programs, should be continued, but will be monitored by the Agency to ensure that they are consistent with the overall County plan.

Future Private/Public Sector Facilities - UCRRA shall conduct a review of all applications for future recycling facilities in the County to determine if they are compatible with the SAC System. Discussion with owners of such facilities, if necessary, will be undertaken to resolve any conflicts. UCRRA will take all steps necessary to phase the commercial/industrial sector recyclable waste stream into the County program.

Evaluation - UCRRA shall study the results of the SAC program after three years of operation and utilize the information generated to determine whether the SAC System is sufficient for the long-term program or whether development of other facilities or programs are required.

Phase 4 - Long-Term - The long-term program is scheduled to commence in 1993-1994. This phase is designed to maximize recycling to the greatest extent technically and economically practical. By this time, due to the expanded SAC System, County waste reduction/recycling (including composting) will be approaching the State goal of 40% recycling and 10% waste reduction by 1997. In order to exceed the State goal by 1997, UCRRA recommends that, at a minimum, the following formal steps be taken:

- **Evaluate the SAC System** to determine if this can be the long-term solution or if a different type of processing facility is necessary to meet long-term needs;

- **Develop a Program** to manage recyclables which have no market;

- **Expand Markets and Materials** to the greatest degree possible in an effort to exceed 40% recycling;

- **Maximize Education Efforts** - Maximum effort should be expended by UCRRA through education, public information, campaigns, and negotiations with the County to increase recycling participation rates;

- **Legislative Review** - Existing mandatory recycling legislation should be reviewed with an eye toward amending it to cause a further increase in participation rates; and

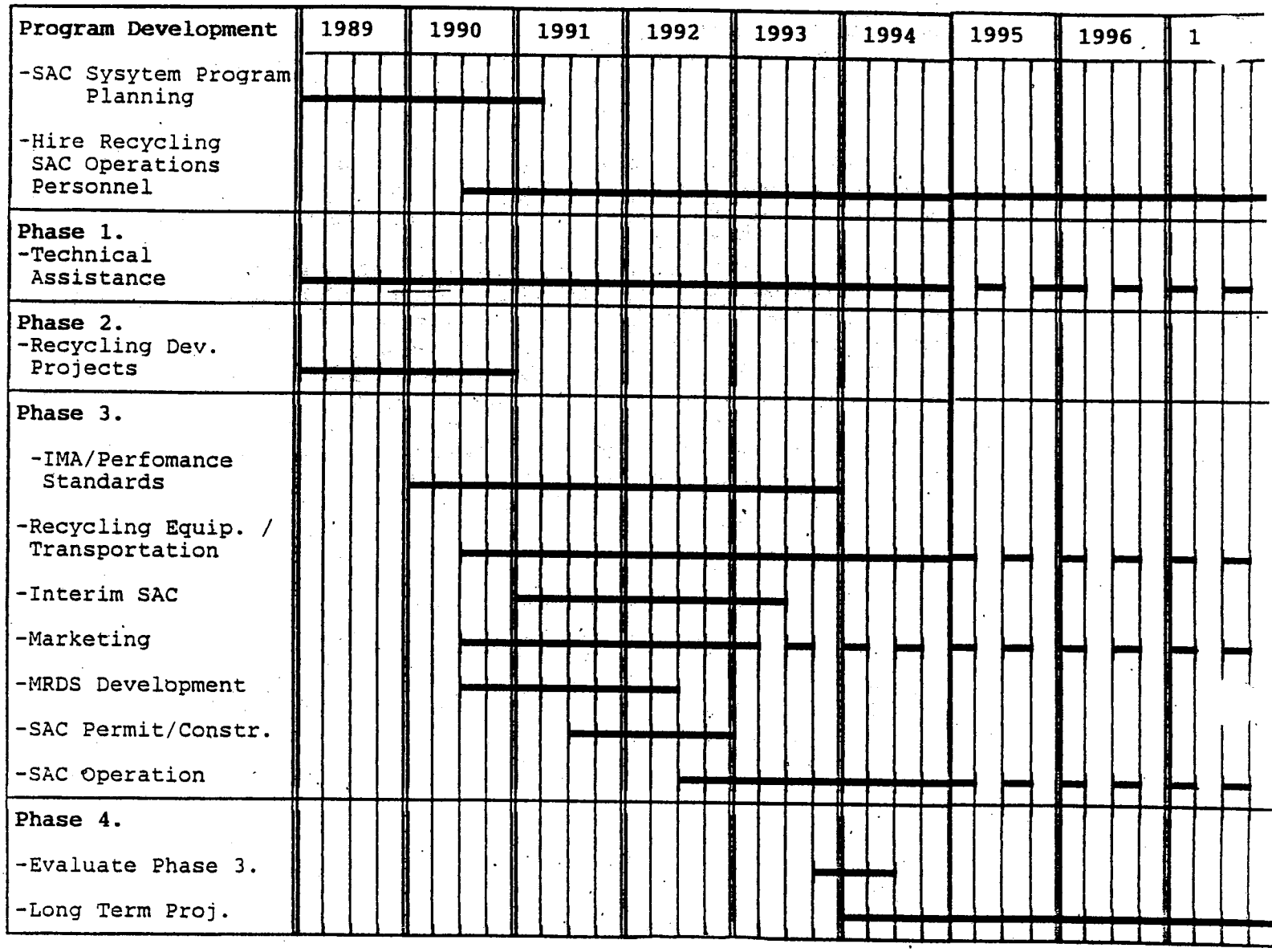
- **Recyclables Collection System** - The long-term recycling program will provide for a recyclables collection system similar to garbage collection by requiring, through local or County law, that private haulers collect separated recyclables from their customers. In addition, local MRDS will be expanded and maintained for residents who self-haul their garbage. Haulers will be encouraged to use the MRDS and the Agency's SAC System: No later than September 1, 1992 in accordance with the Source Separation requirements of Section 120-aa of the General Municipal Law, curbside collection of recyclables must be offered as a service in those areas and for those customers that receive curbside collection of refuse.

Figure 9-1a shows that Ulster County is currently recycling 4.6% of the residential waste stream (includes reuse), 1% of the commercial waste stream (includes C&D), and is composting and/or diverting 7.3% of the municipal organic waste stream (includes sewage sludge) for an overall 1990 recycling/composting rate of 12.9%. All of the remaining wastes (87.1%; 580 tons per day) are being landfilled.

With the SAC System, both major and miscellaneous recyclable materials are further processed and transported to market. Considering that this System will be fully operational in 1994, it is expected that the overall percentage of the waste stream likely to be reduced by allocating recyclables to the SAC System will be 20-25% by 1994 and 25-35% by 1997. It should be noted that this is not the overall recycling percentage expected to be achieved by the total "Plan". It only relates to the SAC System component. The overall recycling efficiency will be increased by the other recycling/composting measures discussed in Sections 9.3.4, 9.3.5, and 9.3.6 below.

The following chart depicts the Implementation Schedule from 1989-1997 for all phases and all components of the SAC System.

RECYCLING - SATELLITE AGGREGATION CENTER (SAC) SYSTEM IMPLEMENTATION SCHEDULE (1989 - 1997)



9.3.4 RECYCLING - MISCELLANEOUS MATERIALS RECYCLING PROGRAM

A miscellaneous materials recycling program is planned for those portions of the waste stream that are not currently included in the SAC System (under the IMAs), and are not considered major materials recycling. Miscellaneous materials include, but are not limited to:

- Magazines
- Junk Mail
- Phone Books
- Brown Bags
- Paint
- Waste Oil
- Textiles
- Window Pane Glass
- Scrap Metal (mixed)
- Appliances
- Plastic (other than containers)
- Rubber
- Batteries

In some Ulster County communities, many of these materials are being recycled at varying rates. All are potentially recyclable products that are commonly generated in the home, but are not easily segregated and collected in separate containers by the residents. Specific recycling schemes should be developed and implemented to handle these types of materials. Once a municipality establishes a collection practice for receiving these materials at their MRDS in a condition suitable for market, they can be included in the SAC System, through a mutual amendment to the IMA, by the Town and UCRRA. In an effort to assist the participating municipalities and to have more of these miscellaneous materials included in the SAC System and ultimately increase the recycling rate, UCRRA recommends that, at a minimum, the following activities be implemented beginning in the summer of 1991:

- **Pilot Efforts** - UCRRA will develop and implement multi-municipal pilot miscellaneous materials recycling programs with those municipalities willing to collect these materials at their MRDS. These pilot efforts will be made available to municipalities participating in the SAC System under the IMA.

- **Equipment and Transportation** - UCRRA will purchase the necessary equipment needed to transport the materials from the MRDS to the SAC or market. UCRRA will also provide transportation services. The participating municipality will be responsible for collecting the materials at the MRDS in a condition specified by the Agency and/or the Market.

- **Materials Marketing** - UCRRA will negotiate agreements with various markets for each miscellaneous material being recycled. UCRRA will seek long-term market agreements.

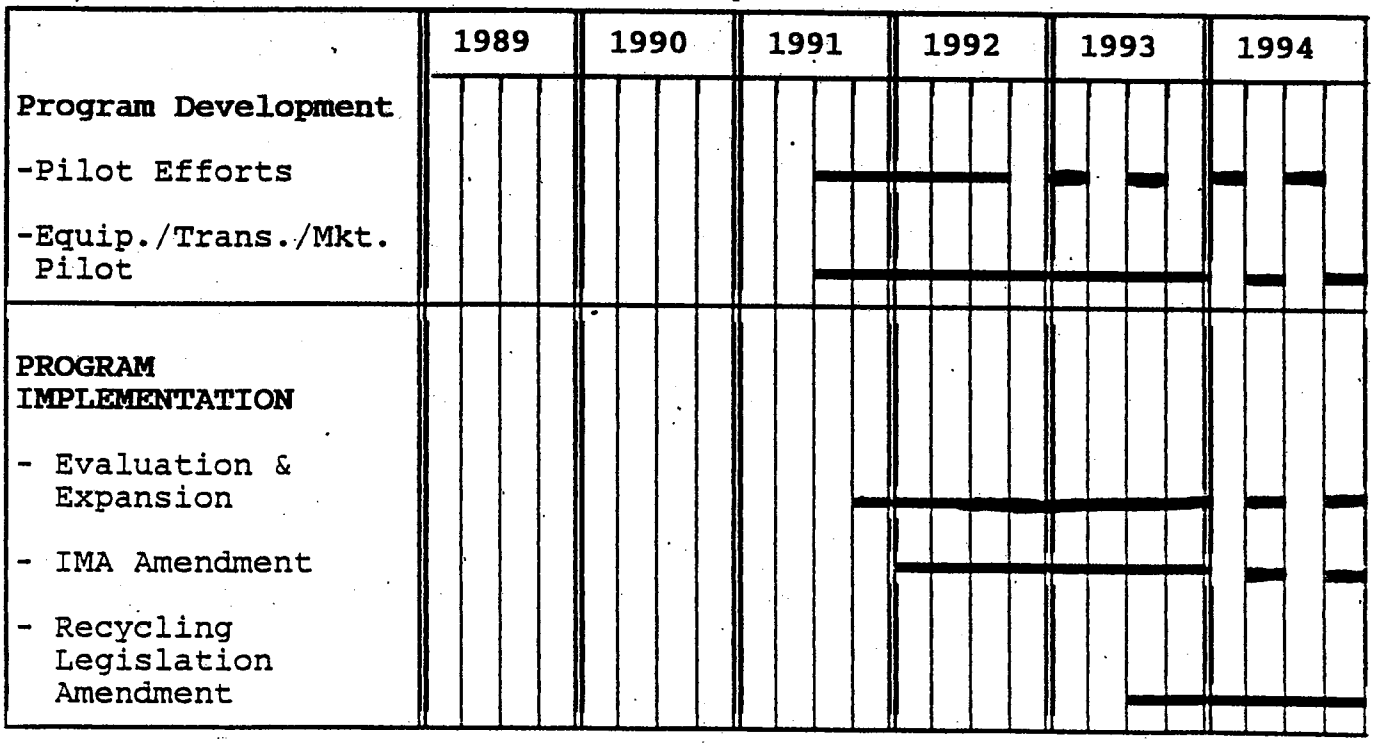
- **Evaluation and Expansion** - The pilot efforts will be evaluated during 3-6 months of operation to determine their success. Successful programs will be expanded to include other municipalities and/or other materials. All miscellaneous recyclable materials will be evaluated for inclusion in the overall recycling program between the Fall of 1991 and Summer of 1992. The order of each materials evaluation is not known, but all will be evaluated according to procedures developed as a result of the "junk mail" pilot effort. The order of inclusion in the IMA will be determined by mutual agreement between the Agency and Municipality. Whereas, the order for inclusion into the Law will be determined by economic markets and the recommendation of an "Oversight Committee".

- **IMA Amendment** - Through mutual agreement by the participating municipality and the UCRRA, the IMA will be amended to include specific miscellaneous materials recycling as part of the SAC System.

- **Amendment to Mandatory Recycling Legislation** - At the appropriate time, UCRRA will recommend that any specific miscellaneous material be added to the mandated list of materials to be recycled under the IMAs.

The chart below presents the implementation schedule for the Miscellaneous Materials Recycling program:

MISCELLANEOUS MATERIALS RECYCLING PROGRAM IMPLEMENTATION SCHEDULE (1989-1994)



9.3.5 RECYCLING LEGISLATIVE, EDUCATIONAL, AND INSTITUTIONAL PROGRAMS

In addition to a major waste reduction program through education and legislation, a household hazardous waste reuse and disposal program, a SAC System for major materials recycling, and a miscellaneous materials recycling program (described above), UCRRA plans to implement a series of Legislative Educational and Institutional measures designed to:

- help maximize County recycling efforts to the greatest technically and economically practical;

- help meet or exceed State goals as established under the 1988 NYS Solid Waste Management Act and County goals established in this "Plan";

- provide a framework for implementing the Capital Programs (HHW Disposal, SAC System, etc.) described previously;

- help increase recycling public participation rates and separation efficiencies;

- provide a framework for monitoring program performance; and

- help ensure that proper recycling collection and processing practices are utilized countywide.

Below are UCRRA's recommendations for actions that must be implemented immediately, but integrated with all other "Plan" components including waste reduction, recycling, composting, and landfilling. Timely implementation and proper integration will ensure that the entire Solid Waste Management Plan is successful. Therefore, at a minimum, UCRRA will implement the following:

MANDATORY SOURCE SEPARATION AND RECYCLING LEGISLATION

Measures must be taken to have Countywide Mandatory Source Separation and Recycling Legislation implemented by September 1, 1992.

Maximization of recycling within the County will be achieved in large part by the establishment of the Agency's SAC System, the education program, and the voluntary compliance of the local governments and the people of the County. However, maximization will be insured if the County adopts, administers, and enforces mandatory source separation and recycling legislation. This law will provide not only a legal definition of the County's commitment to "recycling maximization", but will also provide the legal and administrative framework to ensure that this policy is carried out.

While the UCRRA has been designated the planning unit pursuant to 6 NYCRR Part 360-15 and the Agency has been given powers to develop and implement solid waste management planning within the County pursuant to Title 13-G of the Public Authorities Law of the State, only the Ulster County Legislature, or the various municipal boards and councils, have authority to adopt mandatory source separation and recycling legislation.

UCRRA recommends that the Ulster County Legislature adopt a Countywide source separation and recycling law. Local governments within the County could also adopt and enforce such legislation, but in order to insure a well-coordinated and effective program, local legislation would have to yield to the County law if any conflicts arise. This is only logical and just because the solid waste management plan being developed is for the benefit of the entire County, and the Countywide Resource Recovery Agency is given the obligation to develop and implement the plan. Therefore, controlling legislation at the County legislative level is required.

Development of mandatory source separation and recycling legislation for the County will proceed in accordance with the following schedule:

Implementation Step	Completion Date
Step 1 - Ulster County Resource Recovery Agency staff and consultants prepare draft legislation	**April 30, 1991**
Step 2 - Ulster County Resource Recovery Agency Board reviews and provides conceptual approval of mandatory legislation	**May 31, 1991**
Step 3 - Proposed mandatory legislation is forwarded to the Ulster County Legislature for review by the Community and Environmental Affairs Committee	**August 31, 1991**
Step 4 - Mandatory legislation is presented to the Legislature for final action	**September 30, 1991**
Step 5 - Mandatory legislation to take effect for residences	**March 31, 1992**
Step 6 - Mandatory legislation to take effect for commercial establishments	**September 1, 1992**

Examples of mandatory legislation in existence in 1989 are attached to the Recycling Action Plan. The Agency spent sometime last summer developing a first draft of a mandatory law. The draft is being revised now and would, with significant refinement, provide the basis for development of the final legislation.

RECYCLING EDUCATION

Promotion and public education programs as well as the initiatives necessary to support the Development and Expansion Phases will be implemented immediately.

The public education programs in recycling will be designed not only for recycling, but to support UCRRA's ongoing public information activities in connection with the County's overall Solid Waste Management Plan.

UCRRA finds that the development of educational programs, especially those established for schools, is of paramount importance in establishing the recycling program. UCRRA has established, funded, and filled the position of Recycling Coordinator/Educator to oversee the development of its educational program and has received funding from the State through the Local Resource, Reuse, and Recovery Grant Program (LRRRP). Through its Recycling Coordinator/Educator, and in cooperation with Municipal Recycling Coordinators, UCRRA will:

- Fund, develop, and carry-out the short and long-term recycling education programs (as described in the RAP, Section 6.0 and the Recycling Education Work Plan found at the UCRRA offices);

- Immediately begin its short-term (1990-1992) public educational efforts according to the Recycling Education Work Plan; and

- Initiate a long-term public educational program according to the recommendations outlined in Section 6.0 of the RAP as amended by the Recycling Coordinator/Educator and the Board of UCRRA.

Public information campaigns are also essential for successful recycling program. UCRRA will continue its efforts through the Recycling Coordinator/Educator to provide a frequent and effective flow of information to the public concerning the status and future implementation of elements of the reuse, reduction, and recycling plan. UCRRA should maximize funds from the LRRRP grant program for such purposes and, working through municipal recycling coordinators, will coordinate the development of informational campaigns with the municipalities of the County.

UCRRA's public relations and education program will also include specific actions related to the initiation of new facilities, addition of new materials for recycling, and future program development. A detailed recycling education program work plan can be found in Chapter 12, Section 12.3 of this document. This work plan identifies various educational activites that will be implemented in future years when solid waste management facilities have been built and are in operation.

COLLECTION AND PROCESSING AGREEMENTS

The following summarizes the recommendations pertaining to recyclable materials collection and processing:

- A partnership approach to recycling should be established based on coordinated source separation and recycling efforts among private haulers, municipalities, and the UCRRA;

- Cooperative arrangements should be developed between the UCRRA and each municipality specifying source separation practices and establishing the responsibilities of both parties. UCRRA should encourage municipalities to pass non-conflicting mandatory recycling legislation;

- Municipalities that own landfills or transfer stations should enact local legislation that bans disposal of recyclable materials at the landfills;

- Municipalities should stipulate that the haulers should commence separate curbside collection of recyclables; and

- No later than September 1, 1992 in accordance with the Source Separation requirements of Section 120-aa of the General Municipal Law, curbside collection of recyclables must be offered as a service in those areas and for customers that receive curbside collection of refuse.

WASTE STREAM TRACKING SYSTEM

UCRRA will develop a continuous, comprehensive Waste Stream Tracking System to identify component parts of the waste stream and monitor recycling and recovery rates which can be used (among other purposes) to assess the Agency's compliance with the State goals and the objectives of this "Plan".

MISCELLANEOUS RECYCLABLE MATERIALS MARKET SURVEY

UCRRA has identified a number of miscellaneous (non-IMA) materials with recycling potential (see Chapter 4.0 of this document). In cooperation with participating municipalities UCRRA will:

Determine the need to market these materials based on quantity collected;

Review current market arrangements (between towns and various markets) for these materials to assess their suitability;

Conduct a market survey for any specific miscellaneous (non-IMA) material for which there is no suitable agreements. The Market Survey will include at a minimum the following:

- quantity and quality requirements
- contractual requirements
- transportation requirements
- processing and upgrading which may be necessary to assure market acceptance of the material(s)
- any current or future restrictions to develop this particular market

Consideration of these materials will be an ongoing process with the goal of adding as many as possible to the SAC System during the next two years.

COMMERCIAL/INDUSTRIAL/INSTITUTIONAL RECYCLING (CIIR) EXPANSION PROGRAM

Office paper and old corrugated cardboard (OCC) and all materials for which an economic market exists, as well as "regulated Recyclables", are the materials which are initially targeted under the CIIR Expansion Program. Other materials will be added after commercial waste audits and CII Recycling plans have been submitted and evaluated. These plans must be submitted by the CII sector beginning September 1, 1992 in accordance with the County's Mandatory Source Separation/Recycling Legislation. (Refer to appropriate sections in the proposed Law which is appended.) Further, as the Agency establishes Local Waste Exchange Information Services, other materials will be added to the Expansion Program.

In an effort to expand the Countywide Recycling Program; and to include Commercial/Industrial/Institutional Recycling (CIIR) activities in the Program; and to ensure that material recycled by CIIR are properly managed, the UCRRA through its Recycling Education plans to at a minimum implement the following actions:

Telephone survey of MRCs to assess 1990 baseline commercial, industrial, and institutional efforts (January - February 1991).

Distribute worksheets for MRCs to track local commercial/industrial/institutional recycling efforts. Have them focus on the businesses and institutions that are not yet recycling (February-June 1991).

Prepare a guide for commercial, industrial, and institutional waste reduction and recycling, with survey and audits, and report volume information (June-September 1991).

Hold Commercial/Institutional/Recycling Seminar co-sponsored with Chambers of Commerce and local business associations, featuring "good example" (IBM, Central Hudson, Rotron, SUNY/New Paltz, etc.). Include workshops of like businesses (schools, restaurants, realtors, etc.) to share experiences and help each other prepare to make transition to recycling (Fall, 1991).

Expand Ulster County Office Paper Pilot to all county facilities, then to commercial businesses and institutions (January-December 1991).

Develop waste reduction strategies and local waste exchange information (Fall, 1991).

Provide technical assistance utilizing network of local MRDS. (continuous).

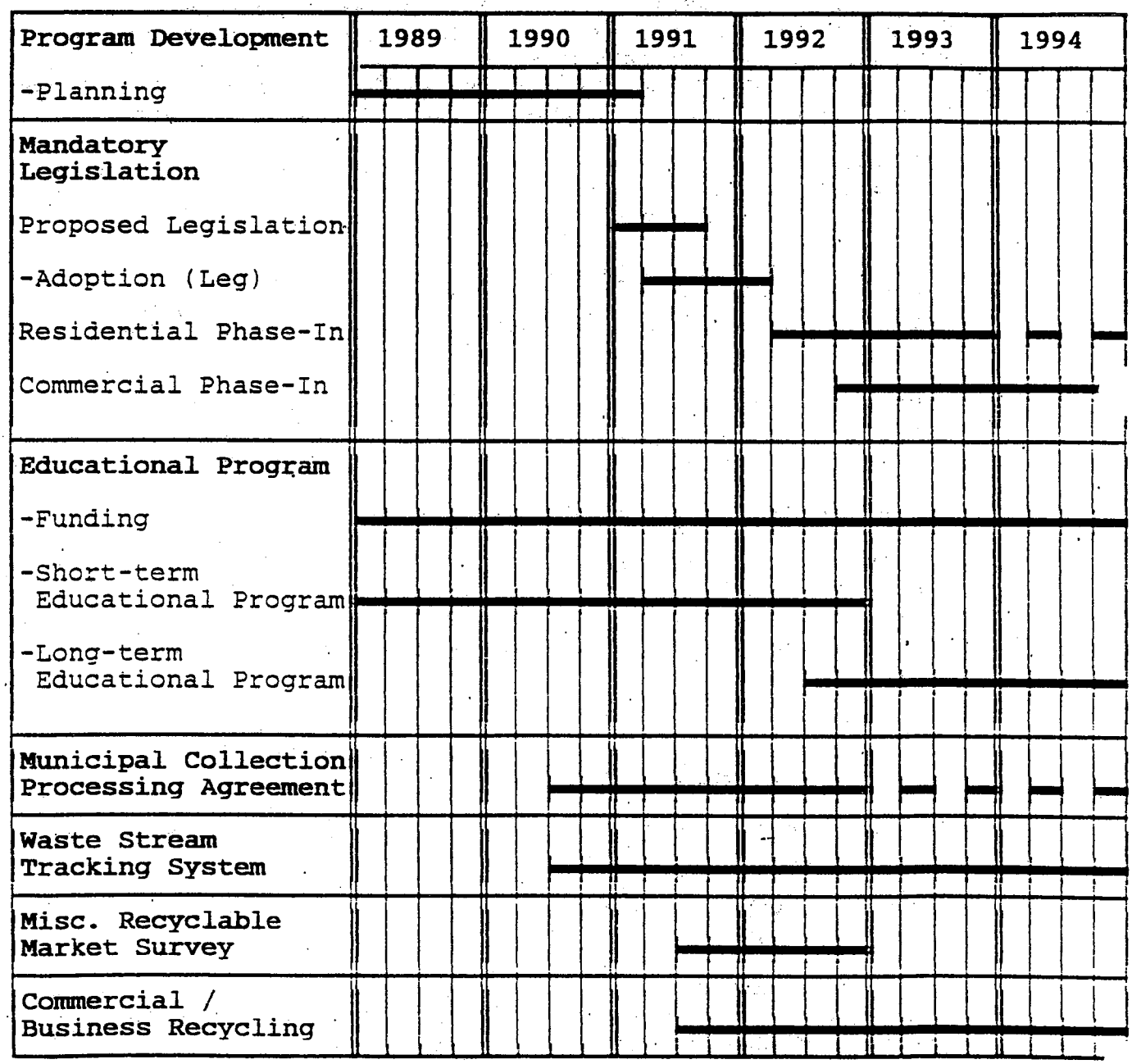
Monitor progress on an ongoing basis and develop tracking system to record types and amounts of materials being recycled through MRDS or other marketing services (June-December 1991).

Include CIIR in mandatory recycling legislation. Solicit input from representatives of these sectors in the development of such legislation. (Spring 1991).

Maximize commercial and institutional waste reduction and recycling in Ulster County to the greatest extent technically and economically practical.

The chart below shows how the Legislative, Educational, and Institutional programs will be implemented in a timely and coordinated fashion. Implementation of these programs has been coordinated with implementation of the other recycling and solid waste management programs called for in "The Plan". For instance, Mandatory Recycling Legislation is not scheduled to be in full effect until after the SAC System is in operation and after major Educational Programs for residents and the commercial sector has been carried out.

IMPLEMENTATION SCHEDULE (1989-1994)



9.3.6 CONSTRUCTION AND DEMOLITION (C&D) DEBRIS RECYCLING AND VOLUME REDUCTION PROGRAM

Construction and demolition (C&D) debris refers to wood waste and rubble generated during construction, demolition, refurbishing, and renovation activities. The wood waste portion (beams, pallets, plywood sheets, etc.) can be handled by the Agency's Tub Grinder which grinds wood into wood chips or by facilities in the private sector which process wood into wood chips, shavings, or sawdust. The rubble portion which generally consists of wallboard, concrete, metal, asphalt, stone, brick, etc. can also be processed by the private sector which handles this type of material. Some of the materials can be separated out and recycled. Others can be ground up (volume reduced) and brought to a landfill where, if "clean" enough, may be used as cover material.

For the most part, C&D debris generated in the County is collected separately by private carters. One minor exception is the small amounts generated by homeowners through home improvement projects may be collected together with household refuse.

The rate at which C&D debris is generated is a function of both new revitalization and renovation activity taking place. Economic conditions also have considerable impact on the level of construction activities taking place. In 1990, approximately 19,418 tons (or 53 tpd) of C&D waste was generated in Ulster County. This represents 8% of the entire waste stream. Only a small amount of this was recycled, volume reduced, or composted. Most was either burned or deposited directly in municipal landfills. Prior to its decision to select the management strategy for C&D wastes that is outlined below, UCRRA conducted a full evaluation of alternative C&D management options. This evaluation can be found in the DGEIS, Volume IV (RAP), Section 5.5, pages 5-25 through 5-27.

The County's goal is to achieve 40% recycling of C&D wastes by 1997. UCRRA recommends that collecting, processing, and disposing (except for wood wastes handled by the Agency's Tub Grinder) of C&D materials be handled by the private sector with UCRRA having overall management responsibilities. In order to meet the goals outlined above and ensure proper management of this material, UCRRA will at a minimum:

Encourage Private Sector Initiatives in the area of construction and demolition debris recycling and volume reduction;

Monitor Private Sector Activities and act as a participant in permitting procedures before the NYSDEC, with regard to private sector facilities;

Pursue Licensing Private Sector C&D Facilities through either the UCRRA or County Department of Health;

Provide for proper and reasonable notification to the appropriate firms that primary C&D waste management responsibility is the UCRRA's;

Provide reasonable assistance, both technically and/or economically, whenever possible; including acting as a technical and administrative clearinghouse for all responsible firms;

Provide administrative guidance whenever possible to any responsible firm; Emphasizing that waste reduction and recycling alternatives be used as the primary method of processing;

Provide incentives (i.e. financial) possible to ensure proper handling;

Develop an effective C&D waste monitoring, tracking, and reporting system;

Encourage generators of C&D debris within the County to separate this waste into at least four categories: wood, metal, rubble, and the remainder;

Recommend that mixed metals be marketed to scrap metal dealers unprocessed;

Ensure that unprocessed rubble be used as fill in closure operations at existing municipal landfills in compliance with NYSDEC regulations. The County will also explore the possibility of sorting the materials and using portions of the C&D debris as clean fill;

Continue to grind C&D "Wood Wastes" (using the Agency Tub Grinder) into wood chips at municipalities where these wastes are collected separately so they may be used as compost or landfill covers;

Encourage Municipalities to establish collection procedures which ensure that wood wastes and other recyclables are separated from the C&D waste stream;

Negotiate and enter into Municipal Agreements (MCAs) with participating municipalities which provide for the processing (at municipally designated sites) of clean wood wastes by equipment and contractors or personnel at no cost to the municipalities;

Mandate C&D Recycling by including C&D recycling in the County's Mandatory Source Separation and Recycling Legislation;

Design "Flow Control" legislation to encourage haulers to collect C&D debris separately and to discourage mixing of C&D debris with regular "Garbage";

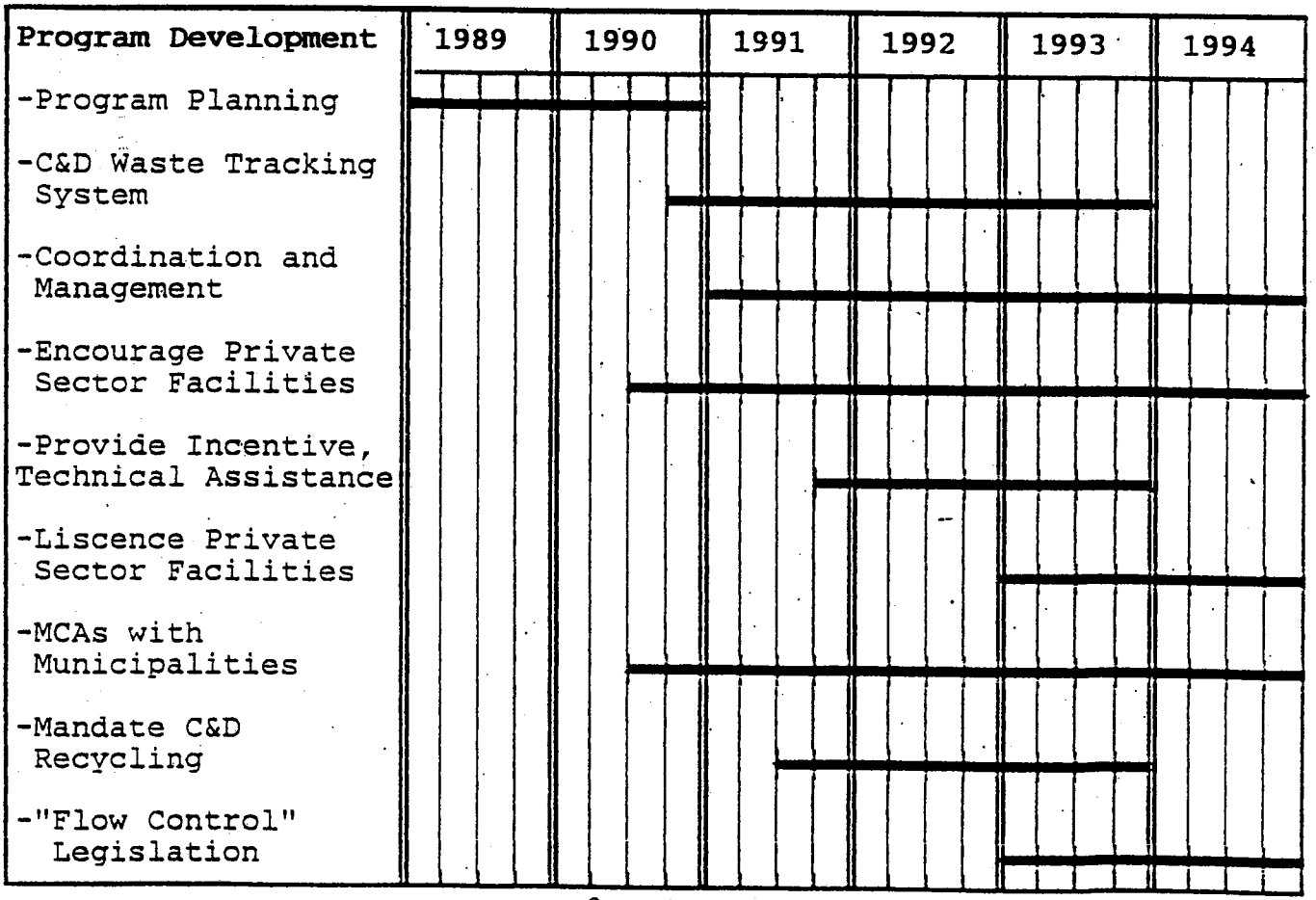
Provide overall coordination and direction to ensure proper management.

As this program is implemented, UCRRA will continuously and carefully evaluate the performance of the private sector in helping to meet the County's needs and objectives. Should the UCRRA determine that the County needs are not being met, UCRRA will construct, permit, and operate a municipally-owned C&D recycling and volume reduction facility.

The time line for implementing the various components of this program can be found on the implementation schedule below.

A determination to construct and operate its own facility would be made after the private sector has been given the opportunity to construct and operate C&D recycling facilities. This will occur in mid-1992, after the C&D waste tracking system is in place and providing the necessary data to assess the County's ever changing needs. One private C&D recycling facility has recently been permitted and is operating within the County. An evaluation of its success in mid-1992 will also be included in the criteria to make this determination.

C&D RECYCLING AND VOLUME REDUCTION PROGRAM IMPLEMENTATION SCHEDULE (1989-1994)



9.3.7 MUNICIPAL ORGANIC WASTE COMPOSTING AND DIVERSION PROGRAM

Organic Waste Composting is the biological degradation of organic material into a product suitable for soil amendments or other uses. In the context of this "Plan", UCRRA intends to apply the science and technology of composting to at a minimum:

- **Yard Waste** (leaves, grass, brush,etc.)
- **Clean Wood Waste** (pallets, C&D wood wastes, etc.)
- **Food Wastes** (generated in large quantities by and collected separately from restaurants, institutions, etc.)
- **Apple and Grape Pomace** (skin, seeds, and fruit residue after making wine or juice)
- **Offal** (waste animal body parts, including fat, bones, hides, etc.)
- **Sewage sludge** (the mixed organic solid waste from the County's water and sewage treatment facilities)
- **Paper** (soiled, wet, or otherwise unmarketable as a recyclable.)

Organic Waste Diversion is a program designed to divert the waste (before it enters the waste stream) for alternative uses such as animal feed supplement, recycling, and/or composting. UCRRA intends to apply an Organic Waste Diversion Program to the above listed waste as well.

Taken together, these wastes represent 30-35% of the County's waste stream. In 1990 approximately 86,064 tons (163 tpd) was generated and most was disposed of in municipal landfills. UCRRA's goal is to divert, capture, and reuse for compost 95-100% of these materials by 1997. In order to meet this goal, several programs (described below) must be developed and certain facilities must be constructed and permitted. UCRRA intends to phase-in its Organic Waste Composting and Diversion Programs and integrate them with its recycling and waste reduction plans. Those organic wastes that cannot be diverted for beneficial reuse, will be directed to either a municipal or the County's compost facility. The following actions are what UCRRA finds (at a minimum) must be accomplished in order to have its composting/diversion programs in full operation by 1994.

MUNICIPAL YARD WASTE COMPOSTING

UCRRA has found and determined that reduction and processing of municipal yard waste to a marketable composting material is a practical, cost effective, and environmentally sound means of managing this waste. The Municipal Yard Waste Composting Program, like the recycling program, will be phased in over time. Presently, UCRRA is operating a Tub Grinder and other equipment to provide assistance to municipalities in

managing brush, clean wood wastes, and yard waste (leaves and grass clippings). These materials, if processed properly, form an excellent compost and are kept from being burned or clogging landfills. Prior to making its decision to implement the yard waste management strategy outlined below, UCRRA conducted a full evaluation of the alternatives for collection of yard wastes. This evaluation can be found in the DGEIS, Volume IV (RAP), Section 5.4.4, pages 5-17 through 5-21.

For the short-term and as an interim step in implementing a Yard Waste Composting Program, UCRRA will:

Provide technical assistance to the Ulster County municipalities by developing a yard waste composting manual and providing composting equipment. UCRRA will also work with municipalities in establishing local yard waste composting sites;

Purchase necessary specialized mobile equipment (such as a Tub Grinder and tractor) for use at municipalities in reducing the volume of yard waste and processing yard waste into compost;

Negotiate an operating agreement with the County government for operation, storage, transportation, and maintenance of municipal yard waste composting equipment on a cost reimbursement basis;

Negotiate and enter into Municipal Composting Agreements (MCAs) with participating municipalities which shall provide for the processing (at municipally designated sites), of yard waste materials, by UCRRA equipment and contractors or personnel at no cost to the municipalities;

Encourage and negotiate agreements for combined area Municipal Yard Waste Composting Facilities where needed;

Provide technical and legal assistance to those communities needing a NYSDEC Compost Facility permit;

Through recycling staff, and in conjunction with Cornell Cooperative Extension of Ulster County, encourage backyard composting of leaves and grass and provide educational programs to that effect.

Subsequently, the UCRRA will develop and implement a long-term, municipal organic composting program. This program will include the construction and permitting of at least one Countywide Composting facility (in addition to the municipal sites) for the purpose of co-composting yard wastes, sewage sludge, food wastes, pomace, and other organic wastes. The municipal sites will still be functional handling mostly yard wastes (brush, leaves, grass) and clean wood wastes. These sites will be evaluated to assess their effectiveness. Some of them may also need permitting. In order to accomplish this, UCRRA will, at a minimum, take the following actions:

Establish a quality control program to monitor municipal brush and "clean wood" chipping;

Monitor changes in the regulations regarding how brush and "clean wood" can be managed and recommend changes to the regulations to allow for a more flexible management program;

Provide for seasonal curbside collection of leaves throughout the County using leaf vacuum equipment;

Identify an area within Ulster County (through the GEIS process) which is suitable for a central co-composting facility;

Proceed with design and construction of a site for annual centralized yard waste composting operations (see Municipal Organic Waste Composting Facility below);

Test yard and organic waste compost for compatibility with NYSDEC guidelines for such material.

FOOD WASTE DIVERSION PROGRAM

UCRRA will initiate a food waste diversion program. The food wastes generated in large quantities at a source (ie., restaurants, institutions, etc.) should be diverted for alternative uses, such as animal feed supplement or composting if the circumstances permit. To accomplish this:

UCRRA recycling staff in cooperation with Cornell Cooperative Extension of Ulster County will institute a backyard composting educational program which is composed of vegetative matter;

UCRRA recycling staff will investigate the use of food wastes as an animal feed supplement and, if appropriate, assist restaurants and institutions in identifying those who might use it;

UCRRA will establish a pilot research and development project to evaluate the effectiveness of introducing commercial and institutional food wastes into its Municipal Organic Waste Composting Program;

UCRRA will consider implementing the co-composting technology for this material subject to an analysis of the results of the pilot research effort.

APPLE/GRAPE POMACE & OFFAL REUSE/COMPOSTING PROGRAM

The current private sector recycling and reuse practices for these organics will be left undisturbed. The UCRRA will, however:

> **Monitor these private sector** activities; and
>
> **Keep track of** the amounts of material being recycled or reused, include those amounts in County's System, and apply them towards the County's goal.

Since some pomace is being disposed of at municipal sewer treatment plants rather than being used for animal feed, UCRRA:

> **Plans to include this waste stream** in its organic waste co-composting program until a higher and better use is identified;
>
> **Plans to include apple and grape pomace and offal in a pilot research and development project** for municipal organic waste composting referred to above. Subject to an analysis of the results of the pilot effort, UCRRA will consider using the co-composting technology for these materials.

SEWAGE SLUDGE MANAGEMENT PROGRAM

Proper long-term management of sludges generated at Ulster County's municipal sewer treatment plants also comes under UCRRA's authority, and is considered in "The Plan".

During the immediate and interim period (1990-1994), the County may continue to landfill the approximately 40-50 tons per day of sewage sludge generated within the County. This short-term solution is possible because several of the existing municipal landfills have space and will accept sludge. UCRRA desires to assume the management of sewage sludge as soon as possible and has developed a strategy to further reduce the amount being landfilled.

In an effort to find a long-term solution to the sewage sludge management issue, the Hudson Valley Regional Council (composed of five mid-Hudson counties, including Ulster) contracted with the New York State Environmental Facilities Corporation (NYSEFC) to complete a study of sludge management alternatives. NYSEFC completed this two-phase report in January, 1990. The report, entitled Sludge Management Alternatives for Counties in the Hudson Valley, Section 5.5, recommended that Ulster County should consider a sludge management process which

features volume reduction as a long-term management strategy for sludges having high levels of heavy metals (copper, lead, etc.) which exceed Part 360 heavy metal requirements for producing a Class I compost (a Class I compost is considered acceptable for land application). Therefore, it is not anticipated that a sludge or compost from sludge produced in Ulster County would be acceptable for agricultural use. However, the co-composting of sewage sludge with a bulking agent (leaves, wood chips, mulch, etc.) and other organic wastes may render the product suitable for horticultural applications. Therefore, in an effort to further recycle/reuse this waste and to minimize landfilling prior to 1994, UCRRA recommends at a minimum:

That the Ulster County Government continue to participate in regional sewage sludge management initiatives through the Hudson Valley Regional Council and the Environmental Facilities Corporation; and

That the Regional procurement process proceed to receive proposals from qualified vendors to propose the most environmentally, cost-effective, and technologically acceptable alternative for regional sanitary sewage sludge management;

That if the regional procurement process fails, UCRRA will proceed to procure a facility to process sanitary sludge for beneficial reuse (namely co-composting) as soon as practical.

The regional procurement process for a regional sludge management facility began in late 1990 and will continue through 1992. Procurement is being conducted under the Auspices of the Hudson Valley Regional Council with the work being done by the Environmental Facilities Corporation, who are presently soliciting and evaluating responses to a request for proposals for a regional sludge management facility for the Counties of Dutchess, Orange, Putnam, Sullivan, and Ulster. Ulster County is fully participating in this program.

Should the regional procurement process fail to find an environmentally sound, cost effective solution by mid-1992, UCRRA will proceed to procure a facility to process sanitary sludge for beneficial use (namely co-composting). In the meantime (during the Fall of 1991), UCRRA will solicit Expressions of Interest from private sector vendors to gain a better understanding of municipal organic waste co-composting types, approaches, and costs.

UCRRA also recommends that certain County actions be undertaken concurrently with the Regional program. At a minimum UCRRA:

Will continue to monitor local efforts within the County to process sewage sludge and will cooperate with the Ulster County Health Department in this regard;

Will cooperate with the Ulster County Health Department in testing local sewage sludge to determine if it is compatible with co-composting requirements;

Will initiate a "study" on the methods of sewage sludge treatment including the use of sewage sludge in co-composting;

Will consider implementing the co-composting technology for this material subject to the results of the "study" on treatment methods and an analysis of the pilot and research efforts outlined above.

MUNICIPAL ORGANIC WASTE COMPOSTING FACILITY:

The development of innovative or alternative solid waste disposal technologies, such as a municipal organic waste co-composting facility, will reduce the amount of solid waste to be landfilled thus increasing facility life and ensuring a solid waste management plan of greater longevity. Constructing a landfill in cells permits maximum flexibility in allowing other alternatives to work.

UCRRA will encourage the private sector to develop alternative disposal technologies such as municipal organic waste co-composting and construction and demolition debris recycling facilities as long as they are compatible with the solid waste management plan. In order to ensure this, UCRRA:

Will solicit expression of interest from private sector vendors to gain a better understanding of municipal organic waste co-composting types, approaches, and costs;

Will review all private sector proposals for development of solid waste management facilities to ensure compatibility with the solid waste management plan;

Will establish a review process that will assure such plans are compatible with the solid waste management plan and that the private sector is taking risk for such development;

Will support all compatible private sector development initiatives provided those initiatives comply with local zoning and land use controls and satisfy local environmental requirements; and

Will review, monitor, and continuously evaluate private sector initiatives. If after such evaluation, UCRRA finds that the private sector has not met the needs of the County, UCRRA will construct, permit, and operate a municipally-owned organic waste compost facility. UCRRA will also seek the necessary funding to implement these measures.

For the most part, the decision to select a private sector vendor will be made after an evaluation of the Expressions of Interest received are made. A review of environmental and economic considerations of each Expression of Interest will help determine which vendor is chosen. Following that selection, a full Supplemental Environmental Impact Statement (SEIS) will be prepared to determine if the project meets the needs of the County. Should a vendor not be selected or should the SEIS reveal that the project has major environmental or economic impacts that cannot be reasonably mitigated, the UCRRA will construct, permit, and operate a municipally owned organic waste composting facility. UCRRA will also seek the necessary funding to implement these measures.

The current schedule, outlined on the following page, is a time line for implementing, in an integrated manner, the various components of this program and applies to the program whether a private sector facility or a County facility is to be constructed.

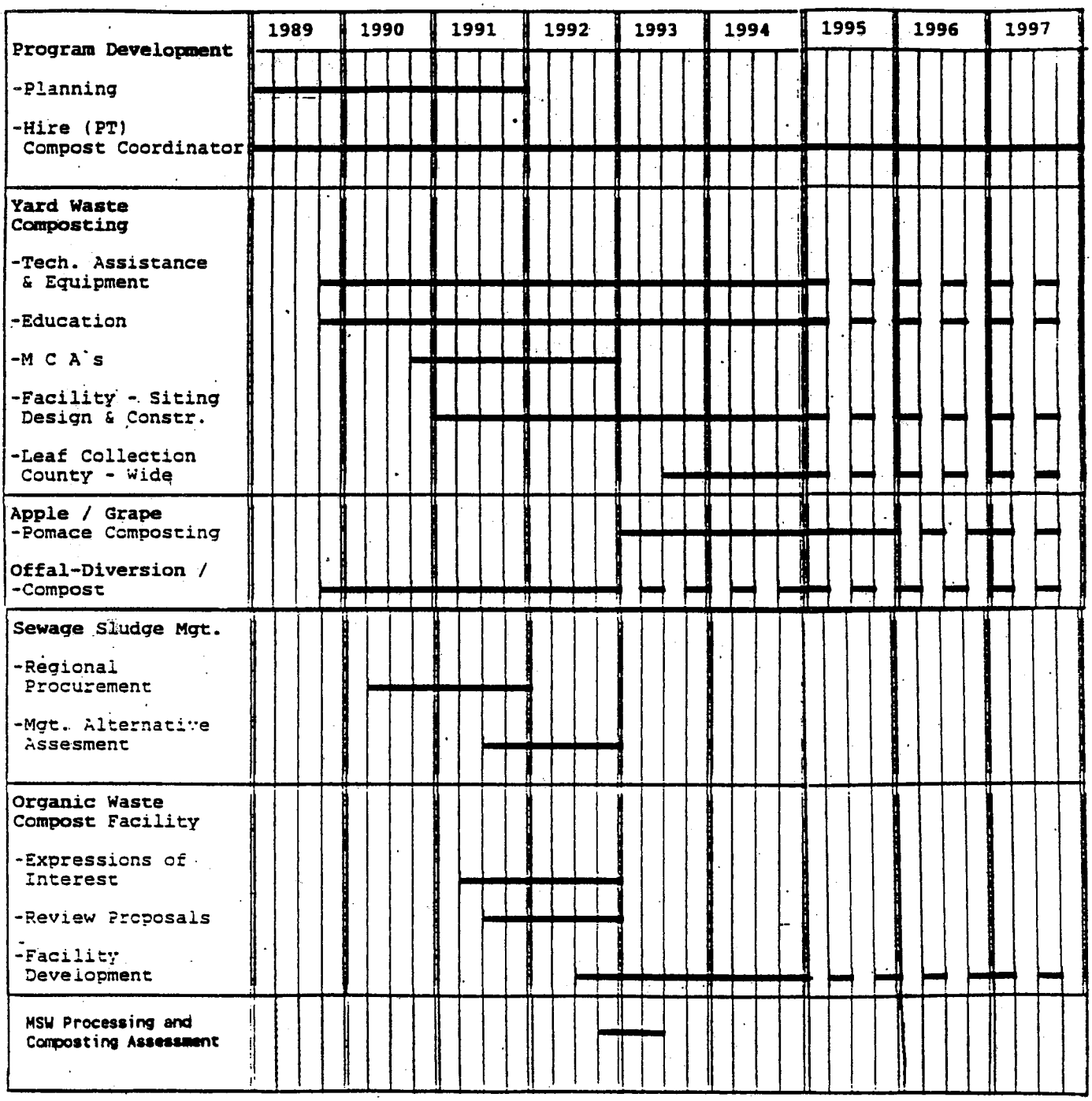
9.3.8 MUNICIPAL SOLID WASTE (MSW) PROCESSING ASSESSMENT

A number of European technologies have recently been marketed in this country which claim to transform mixed municipal solid waste into useable compost product and/or refuse derived fuel (RDF). (See Chapter 5.8 of this document). These technologies are new and several types of facilities are operating on a pilot or demonstrative basis in the United States. The UCRRA maintains that MSW processing is an emerging technology with great promise, and will, more than likely, play a significant role in future solid waste management. However, until such time as the efficiency of the processing systems and, more importantly, the marketability of the compost or RDF end product have been clearly established and proven, the County cannot justify, at this time, committing substantial financial resources toward the development of such a facility at the initial stages of the Solid Waste Management Plan implementation. The UCRRA will only initiate actions which are proven reliable and have significant performance records. Therefore, UCRRA intends:

To monitor MSW processing and composting facilities, and review emerging technologies for integration with the proposed "Plan" at a future phase. Should MSW processing prove to be viable, environmentally sound, and

economical, the County can expect future reduction/ recycling rates to exceed the current goal. An evaluation of the feasibility of MSW processing and composting will be under taken at the end of 1992 through mid-1993.

MUNICIPAL ORGANIC WASTE COMPOSTING/DIVERSION PROGRAM IMPLEMENTATION SCHEDULE (1989-1997)



9.3.9 MEDICAL WASTE MANAGEMENT

Wastes from hospitals, nursing homes, laboratories, clinics, medical offices, and research facilities, veterinary clinics, and mortuaries consist of pathological, red bag, infectious, radiological, hazardous, office and administration and kitchen materials. All but radiological and hazardous wastes may be handled and disposed of as part of a solid waste management plan.

Medical wastes have historically been handled by private sector generators. Disposal methods include incineration at hospitals, red bag collection, haul and disposal by specialized companies at doctors' offices and clinic, and disposal of non-infectious wastes such as kitchen scraps, paper and other office wastes at local landfills.

New York State is implementing strict medical waste incineration limits. This means existing local incineration will no longer be an available option by January 1, 1992.

While no statutory or regulatory definition of the term "Medical Waste" exists, NYSDEC is requiring communities to include medical waste in solid waste management planning.

The private sector has initiated action in this region. The Regional Health Administrators Association is reviewing alternatives to on-site incineration. One of the proposals is to implement a system based on autoclave technology which sanitizes medical wastes through high temperature steam. If the material is processed properly, it is possible to treat the material as solid waste and dispose of it in a landfill. Another alternative being reviewed is the siting of a regional medical waste incinerator that could comply with new regulations. In recognition of the hospitals, institutions, and other generators of medical waste throughout Ulster County, UCRRA recommends that at a minimum:

A study of the medical waste stream in Ulster County be conducted in phases:

Phase 1. - Medical waste to identified and quantified through a generator survey;

Phase 2. - Options for management to be reviewed comparing regional vs. local programs and private sector procurement, ownership, and controls; and

Phase 3. - Technology alternatives be analyzed and compared.

Given the short time frame for implementing the new State waste disposal and treatment regulation requirements, it is imperative that this study begin with all possible urgency. UCRRA recommends that the study be commenced in mid-1991 and be completed by the end of the year.

9.3.10 SINGLE NEW CAPACITY LANDFILL

Introduction - For Ulster County, the solid waste management plan includes using a single new capacity landfill as the primary means of disposing of wastes which cannot be reduced, reused, recycled, or composted. These wastes include certain portions of household garbage, some sewage sludges, construction & demolition debris, by-pass wastes needing disposal when other facilities are temporarily out of service, and those parts of the waste stream where other waste management methods are not practical. It is estimated that the amount of waste needing proper landfill disposal will average approximately 50% of the County's waste stream over the next 20 years.

Although landfilling has the lowest priority in the State's hierarchy, it is essential to all solid waste management planning regardless of the other options that are selected.

Current regulatory requirements in New York State make landfilling an environmentally safe and appropriate part of any effective solid waste management plan. Presently, solid waste planners know they need to utilize a landfill. What must be considered is the types of wastes to be disposed of and the size of that facility.

Today's Landfills - The NYSDEC regulations for solid waste management facilities (6 NYCRR Part 360) require extensive environmental controls, possibly the strictest in the nation, for solid waste management facilities. These regulations contain specific criteria for the various types of landfills, including construction and demolition debris landfills, waste-to-energy ash landfills, industrial landfills, and mixed municipal waste landfills. These regulations were developed to keep the problems of the past from recurring. Among other things these regulations require that:

- Landfills be constructed with state-of-the-art, conservatively designed, liners and leachate collection and removal systems to prevent the uncontrolled migration of leachate or landfill gas below the ground;

- Landfills must also be sited in geologically appropriate areas, with the greatest possible thickness of clay-rich soils, where natural attenuation will be maximized to ensure long-term integrity of the site;

groundwater monitoring system which is capable of rapidly detecting any changes to groundwater quality caused by the facility as a backup measure to protect the environment;

- All waste be covered daily using appropriate materials to prevent above-ground problems, such as vectors, odors, and litter and, once the facility is closed, final cover be installed to minimize rainwater infiltration into the facility;

- Operational measures be taken to reduce the potential mobility of contaminants within the waste mass and to lessen the strength of the leachate. (These provisions include the maximization of waste separation, recycling, incineration, and any other available treatment methods); and

- Stringent gate control and waste inspection measures be taken to prevent the unauthorized disposal of hazardous waste materials.

Landfills are also regulated by State Environmental Quality Review Act (SEQRA), 6 NYCRR Part 617 and 6 NYCRR Part 420 which regulates mining in New York State. If any wastewater discharges exist from the facility, they are regulated by the State Pollution Discharge Elimination System regulations (SPDES), 6 NYCRR Parts 750-757.

Landfill Technology Recommendations - Although emphasis in this plan is placed on an aggressive reduction, reuse, and recycling program as described in the earlier sections of this chapter, the UCRRA finds it will still be necessary to dispose of remaining solid waste in a safe, environmentally sound, and economical manner. The UCRRA finds that the development of a properly sited, designed, and constructed landfill as the disposal facility would provide the most cost effective and environmentally sound disposal alternative for the County. Private sector initiatives in developing alternative or innovative technologies such as municipal organic waste composting and C&D recycling facilities will be encouraged since such initiatives will reduce the amount of solid waste to be landfilled. Having a permanent Household Hazardous Waste Collection program makes landfill disposal an even safer and more environmentally sound practice.

Based on the analysis of the County's solid waste quantities and characteristics and based on the results of an extensive evaluation of alternative approaches and technologies, UCRRA has concluded the following regarding the use of landfilling as a primary waste disposal strategy:

Single New Capacity Landfill - That a single "new capacity" 6 NYCRR Part 360 landfill is necessary to meet the disposal needs of the County for the 20 year planning period 1994-2014.

Landfill Technology - When implemented pursuant to 6 NYCRR Part 360 together with an aggressive waste reduction, recycling/composting program, it represents the most cost effective and environmentally sound strategy for solid waste management in Ulster County.

Landfill Design - UCRRA shall undertake to site, design, finance, construct, and operate landfill technology as the County's primary disposal strategy.

Single Landfill - The "Plan" contains a recommendation for a single, new capacity landfill.

SEQRA Compliance - Siting, constructing, and operating a single, Countywide landfill in accordance with SEQRA and 6 NYCRR Part 360 is the most environmentally sound and cost effective alternative for solid waste disposal.

ification
Added 8/92)

(Section deleted)

Use of Existing Landfills - No existing landfills in the County could be developed as an alternative to a new landfill.

Reclamation of Landfills - Technology for reclamation of existing landfills is in a developmental stage in certain parts of the United States and is in a research and developmental stage in New York State. Consequently, it is not presently available as a practical, economical, and environmentally sound means to expand capacity at existing landfills as a Countywide solid waste disposal solution.

Transfer Stations - The development of transfer stations strategically located in the County, possibly at existing municipal solid waste management sites, would provide a cost effective method for transporting waste to a single County landfill. Use of transfer stations will also reduce impacts at the County landfill site.

Landfill Ownership - The landfill and related facilities, such as transfer stations, should be owned and controlled by the public. Therefore, UCRRA shall:

- Procure landfill and related facilities pursuant to authority in the General Municipal Law;

- Conduct or monitor the design and construction of the landfill and related facilities; and

- Control access to the landfill and related facilities by ownership of the facility and operation of the scale house.

Landfill Size - The landfill facility shall be planned to be of sufficient size to handle the solid waste generated in the County for at least a twenty-year planning period. An acceptable size for a landfill footprint, based upon the projected solid waste stream for the County and implementation of an aggressive reduction, reuse, and recycling program consistent with State goals, is 100 acres. The landfill shall be developed in small, manageable cells, ranging in size from a minimum of 5 acres to approximately 10 acres, as needed. Actual size of landfill cells will depend upon site conditions, regulatory requirements, and overall design of the facility.

The size of the proposed landfill reflects a conservative estimate which will provide the County with a maximum flexibility depending upon the success of the reduction, reuse, and recycling program, increase of solid waste generation rates due to population growth or development of innovative technology during the planning period.

Landfill Siting - The landfill facility shall be sited within the County of Ulster to handle its needs. Exportation of solid waste to other areas of the State or country is rejected as unreliable and costly. Participation in a regional facility, at the present time, is rejected as no such facility is being planned by either the public or the private sector, and, optimally, each planning unit should develop its own solid waste disposal strategy within its own jurisdiction for maximum control.

Waste Stream Control - Waste stream control legislation as authorized by Section 2050-t of the Public Authorities Law shall be prepared and submitted to the County Legislature for consideration as it provides an essential guarantee that solid waste generated within the County will be disposed of in a safe and economical manner at the Countywide landfill facility.

The County Legislature has authority to establish reasonable limitations on solid waste transportation and disposal including the direction of the solid waste to a specific facility. This authority superseded that of local governments.

Enactment of Waste Stream Control Legislation is critical to ensure that solid waste is disposed of properly under the solid waste management program, and to ensure that solid waste generated in the County will be brought to the facilities to generate revenues to pay for debt service and operating costs.

Solid Waste Disposal Agreement - A solid waste disposal agreement between the County government and UCRRA should be reviewed with financial consultants and, if appropriate, be prepared as part of the financing of a landfill facility.

Financing - Revenue bonds should be issued by UCRRA to finance UCRRA's facilities, not general County debt. Since the General Obligations bonds impact the County government's debts limit, revenue bond financing should be pursued as the primary financing tool for all facilities.

An agreement between the County and UCRRA ensuring that solid waste generated in the County will be delivered to the landfill to pay the capital and operating cost of the landfill, should be pursued. Such an agreement may be a necessary prerequisite to the issuance of revenue bonds.

(**Modification 8/92)

A Solid Waste Management agreement between the Agency and the municipalities within the County will also be pursued providing for the municipalities to send solid waste to the Agency's facilities and for the Agency to receive and dispose of such waste. A comprehensive agreement may be considered combining the IMAs, MCAs, and the solid waste obligations with one comprehensive agreement.

Ownership/Procurement - Public ownership of facilities offers the greatest degree of control, which is important in long-term projects that address significant environmental issues and involve substantial capital and operating expenditures. While private ownership allocates more of the operating risks to the private vendor, the community will continue to have the ultimate responsibility for disposal of its solid waste should the vendor be unable to fulfill its obligations.

For the above reasons, UCRRA recommends that ownership and control be in the hands of a public agency. This is the only way that the continued operation of a solid waste management facility, in accordance with environmental law, can be guaranteed.

Landfill Siting - During the course of its preparation of the Solid Waste Management Plan, the Agency authorized its consultants to prepare two landfill siting studies. One was called the **Initial Siting Study** (DGEIS, Volume I, Section 7.0) and the other is the **Supplemental Siting Analysis** (SDGEIS, Section 2.0). Both are discussed in more detail in Chapter 8.0 of this document.

The Initial Siting Study focused on finding a site or sites for co-located facilities and did not emphasize siting criteria most applicable to the selected technology - landfilling. This siting study used some criteria earlier in the process than provided for in 6 NYCRR Part 360. It also used a numerical matrix to apply preferential criteria and included on-site testing of the preferred sites as the final testing phase.

The Supplemental Analysis focused on siting a landfill only. It looked at certain areas of the County containing glacial-lacustrine clays. It followed the strictures of 6 NYCRR Part 360 for landfill siting and used a comparative analysis to evaluate candidate areas. No on-site testing was performed, only visual inspection of the candidate areas was done.

For the purpose of this "Plan", UCRRA determined that:

- The Initial Siting Study in the Draft GEIS and the Supplemental Siting Analysis in the Supplemental Draft GEIS, together, provides a firm basis to conclude that all appropriate areas of the County have been reviewed and analyzed for landfill siting purposes and that no superior sites have been overlooked;

- Based upon a hard look at the Initial Siting Study and the Supplemental Siting Analysis, results of these two studies have produced 23 potential candidate areas for landfill development that are reasonable and appropriate.

Figure 9.2 shows the general locations of the 23 potential candidate areas. UCRRA is not prepared to make a findings as to the recommended site for site-specific environmental review and permitting pursuant to 6 NYCRR Part 360 at this time. UCRRA believes that on-site testing must be performed on at least two candidate areas before selection of a preferred site. During the public comment period in May 1990, and in subsequent discussions with NYSDEC, several issues were raised which UCRRA considers are in need of further study. These issues include questions on soil stability, hydrogeology of soils, and archaeologic sensitivity of candidate areas.

While lacustrine clay deposits are preferred for landfill siting, they frequently have a high water table and are poorly drained due to low permeability. This raises hydrogeologic issues.

Lacustrine clay has also been identified as having a lower shear strength than glacial tills. While 6 NYCRR Part 360 states that a landfill must not be constructed in an unstable area, it is recommended in the DGEIS and the S-DGEIS that the lacustrine clays on the candidate sites have sufficient strength to support safe development of a landfill. Through documentary review, no other information that would classify the candidate areas as being unstable was adduced.

Landfill Siting Recommendation - based on the above considerations, UCRRA concludes and recommends the following:

- That a supplement to the Final GEIS must be prepared before the action of selecting a preferred site for on-site review and permitting pursuant to SEQRA and 6 NYCRR Part 360;

- That the appropriate procedures for conducting such on-site review is a supplement to the Final GEIS as defined in 6 NYCRR Part 617.15 (c). This procedure will provide the most significant and meaningful opportunity for public review and comment on the work contemplated;

- That soil stability, hydrogeologic, and archaeologic issues should be reviewed further in on-site testing of at least two candidate areas;

- That the work should be phased so that testing is accomplished in the following order: first, soil stability; second, hydrogeologic conditions; third, archaeological conditions;

- Upon completion, the testing will be evaluated to exclude areas not meeting the basic condition for construction of a landfill and to select an appropriate area for site specific review and permitting;

- That the scope of on-site testing will be established after scoping sessions pursuant to 6 NYCRR Part 617.7; and

- That UCRRA shall seek funding for such on-site testing from the County Legislature pending issuance of UCRRA's revenue bonds.

The time line for implementing the various components and recommendations related to landfill siting, permitting, and construction and operation can be found in the implementation schedule on page 9-54.

9.3.11 LANDFILL CONSOLIDATION PLAN (See Volume II, Modification to Ulster County Solid Waste Management Plan)

**Modification Added 8/92)

UCRRA finds that the existing municipal landfills which are subject to NYSDEC Orders on Consent will be closed in the near future. UCRRA finds that a coordinated, expeditious closure of the landfills is in the best interest of the people of the County. UCRRA further finds that there must be adequate capacity for solid waste disposal between the present and the construction and operation of permanent facilities. This

**Modification Added 8/92)

This disposal capacity must be at the most environmentally sound, existing landfills having sufficient capacity, and use of these landfills must be coordinated so all solid waste that cannot be recycled during this phase is disposed of in an environmentally sound and economical manner.

Therefore a Landfill Consolidation Plan will be developed which analyzes the existing municipal landfills, and rates them in degree of acceptability for use during this interim period. The Landfill Consolidation Plan will be developed using information gathered by NYSDEC, the Ulster County Department of Health, and the municipalities in connection with closure of the landfills under the NYSDEC Orders on Consent.

The Landfill Consolidation Plan will identify at least three landfills which would be operated safely and economically over the interim period and receive all solid waste generated in the County not capable of being recycled. These interim landfills would be called Consolidation Landfills.

The Agency finds, that as the entity empowered by statue to implement the SWMP and by law to control the solid waste stream, it would take over the Consolidation Landfills through agreements to be negotiated with the municipalities which own them. Authorization to operate and close the Consolidation Landfills will be provided by revised or reissued Orders on Consent with NYSDEC. The Agency will assume responsibility for operating, upgrading, and closing the Consolidation Landfills. While this may increase the liability of the Agency if any problems arise at the Consolidation Landfills, the Agency finds that the risk is sufficiently mitigated by selection of the safest landfills for such purpose and NYSDEC's approval of the Agency's takeover pursuant to the Orders on Consent. The risks are justified because the Agency will them be able to assume responsibility and control of the County's solid waste stream, ensuring that, in the interim period, solid waste disposal is handled in the most efficient, coordinated, environmentally sound and economical manner.

The Agency finds that it will direct waste from various portions of the County to the most convenient interim landfill. It is proposed that the Consolidation Landfills be utilized for a period of no more than three years, and will be closed as soon as practical after the new Part 360 Countywide landfill begins operation.

**Modification Added 8/92)

The Agency finds that it should also seek proposals for out-of-County disposal of solid waste as a backup to the interim system, in case one or more of the Consolidation Landfills cease to be available for Agency use. While out-of-County disposal is not an acceptable technology for the long-term, such agreements could be used as short-term alternatives if something unforeseen should occur.

During this period, the remaining existing municipal landfills will be closed under the Landfill Consolidation Plan. Closure will be scheduled to occur in a coordinated manner. The Agency finds that it should assist the municipalities in closure by providing funds to assist and hopefully expedite closure. A fund of $6.5 million is proposed to be financed by the Agency revenue bonds, which funds will be allocated according to a formula to be agreed upon by Agency and County Legislature amongst the municipalities to assist in closure. This program is called the Landfill Closure Assistance Program.

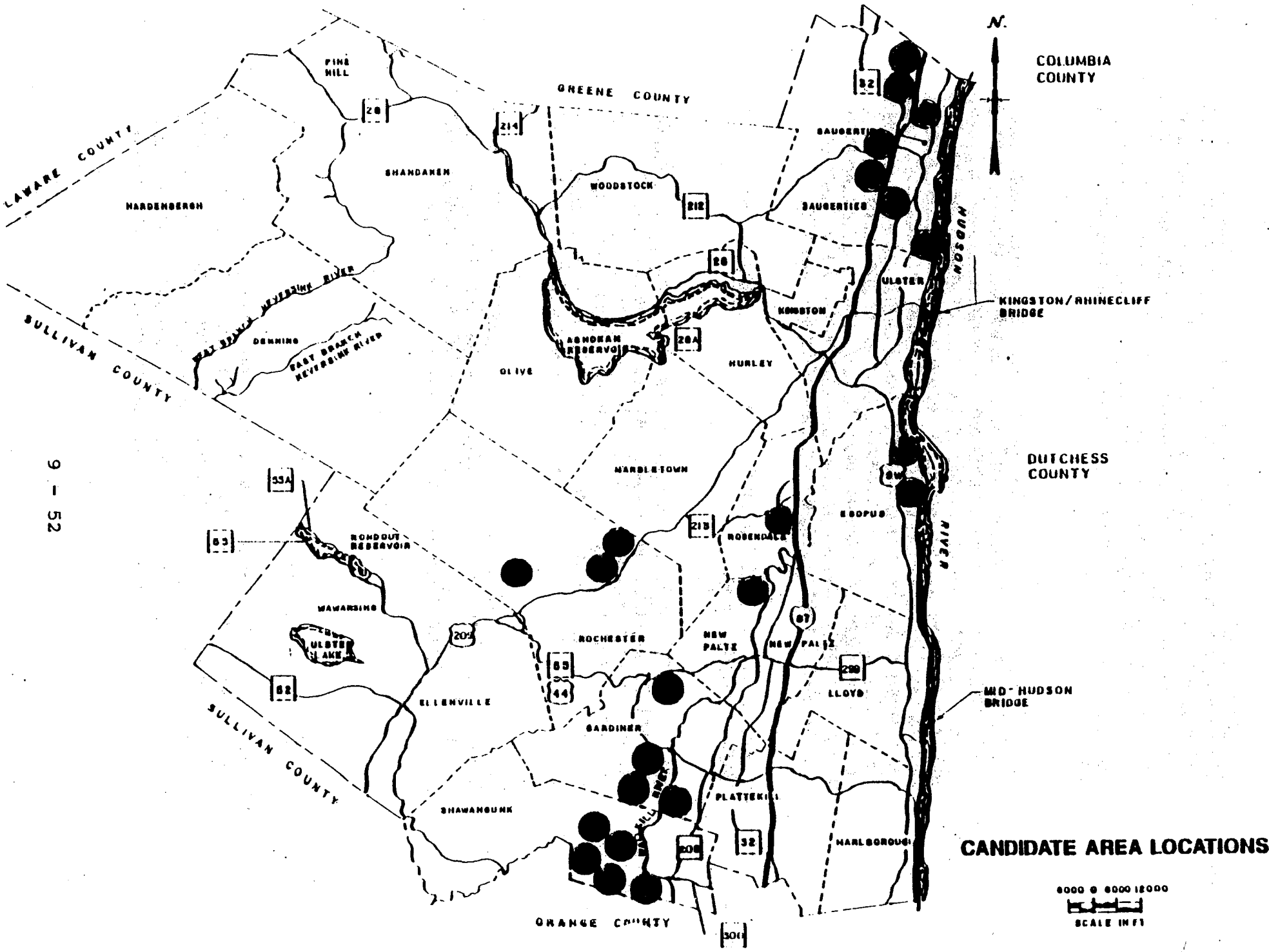
Closure will, of course, be coordinated with and regulated by NYSDEC.

The Agency will negotiate solid waste managemnt agreements with the municipalities who will provide, amoung other things, that the Agency will receive, process, and/or dispose of solid waste and receive, process, and market recyclable materials during the interim period and the balance of the term of the "Plan".

The time line for implementing the various components and actions related to the Landfill Consolidation Plan can be found in Figure 9-4A, Implementation Schedule for Landfill Consolidation (1992-1995) on page 9-63A.

9.4 FINANCING THE "PLAN"

Funding for "The Plan" and related studies, recycling development projects, recycling expansion, and the SAC System have been provided by the Ulster County Legislature, pursuant to an agreement with the Agency dated as of December 1, 1988, as amended. The County Legislature has authorized the issuance of capital notes


N.
COLUMBIA COUNTY
DUTCHESS COUNTY
GREENE COUNTY
DELAWARE COUNTY
SULLIVAN COUNTY
SULLIVAN COUNTY
ORANGE COUNTY
HUDSON RIVER
KINGSTON/RHINECLIFF BRIDGE
MID-HUDSON BRIDGE
PINE HILL
SHANDAKEN
HARDENBERGH
WOODSTOCK
SAUGERTIES
ULSTER
KINGSTON
DENNING
WEST BRANCH NEVERSINK RIVER
EAST BRANCH NEVERSINK RIVER
ASHOKAN RESERVOIR
OLIVE
HURLEY
MARBLETOWN
ESOPUS
ROSENDALE
RONDOUT RESERVOIR
WAWARSING
ULSTER LAKE
ROCHESTER
NEW PALTZ
LLOYD
ELLENVILLE
GARDINER
SHAWANGUNK
PLATTEKILL
MARLBOROUGH
CANDIDATE AREA LOCATIONS
SCALE IN FT

to fund the work to date. The County Legislature has further appropriated funds in its annual budgets to pay for the operating expenses of the Agency.

"The Plan" provides for the funding of the component projects through the issuance of solid waste management revenue bonds. Once the bonds are issued, funds advanced by the County Legislature will be reimbursed.

(**Modification Added 8/92)

The Agency projects that future capital expenditures for **the Landfill Consolidation Plan, Landfill Closure Assistance Program,** constructing the landfill, SAC buildings, and a composting facility will be necessary. The Agency will develop, after consultation with its counsel and senior managing underwriter, a detailed financing plan and schedule. As set forth in the findings statement, this plan will involve the issuance of revenue bonds by the Agency as opposed to the issuance of general obligation debt by the County. Thus, the cost of the facilities will be borne by the assets of the facilities and not the general taxpayers.

Figure 9-3 depicts the recommended solid waste facilities that will be needed for full plan implementation. Also, listed are estimated capital costs in 1988 dollars for each of the major facilities.

The Agency currently projects that it will be in a position to issue bonds in connection with constructing/permitting two Satellite Aggregation Centers by the Spring of 1992 and for landfill construction by the Spring of 1993. In the meantime, the County Legislature will be requested to appropriate funds to carry the project through the interim phase.

After "Plan" approval, the Agency will prepare and submit to the County Legislature, a proposed 1991 Capital Budget. It will also meet with its financing team and the County representative to develop a specific long-term financing plan and schedule.

9.5 HOST COMMUNITY PROGRAM

Host community programs have been used in other parts of the State and the country in an attempt to minimize the environmental, economic and social impacts associated with solid waste management facilities. The development of such a program for the County would provide a mechanism for the identification of impacts; the negotiation of the steps to be taken to mitigate the impacts, the execution of an enforceable agreement formalizing the results of the negotiations.

SINGLE NEW CAPACITY LANDFILL
IMPLEMENTATION SCHEDULE (1989-1997)

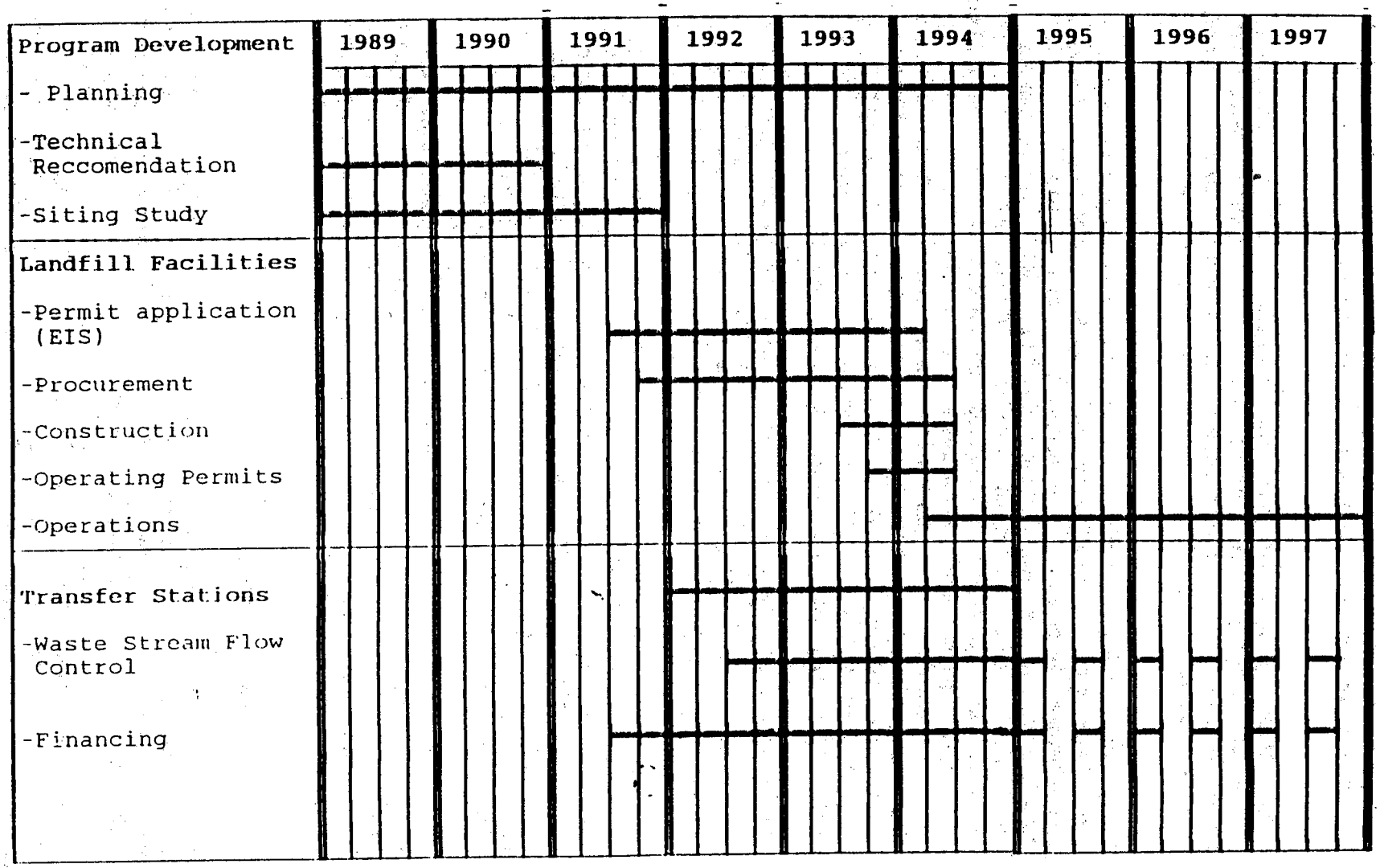


FIGURE 9-3

RECOMMENDED SOLID WASTE FACILITIES

Facility/or Program	Estimated Capital Costs
o Waste Reduction Program	o Under Review
o Recycling - Satellite Aggregation System	o 4-6,000,000
- Recycling Transportation - Equipment and Vehicles - Two SAC Buildings	
o Municipal Yard Waste Composting	o 2-300,000
- Composting Vehicle and Equipment - Municipal Composting Sites	
o Household Hazardous Waste Management Program	o 3-500,000
o Sludge - Regional Sludge Management Program	o Under Review
o Support Private Sector Involvement in:	
- Construction & Demolition Debris Facility - Municipal Organic Waste Composting Facility	Private Sector Costs 3-500,000
o Single - New Capacity Landfill for Solid Waste Disposal	o 63,000,000
- Permitting and Construction - Closure and Capping	
o Transfer Stations System	o 1-2,000,000

NOTE: Capital Cost Estimates in 1988 dollars

A framework for the host community program should be developed at this point. Specific elements of the host community program regarding a particular site can be determined only after negotiations with the host community. UCRRA finds and recommends that:

A Host Community Program as discussed in Section 7.6 of this document, provides the basis for an effective Host Community Program and should be the result of the Host Community and project sponsors.

Citizens Advisory Committee consider and propose for approval a final generic host community program, providing for a technical team component, that is, a component which allows the host community to participate in the review and analysis of technical data obtained and developed by UCRRA. The generic program should call for, at a minimum, the following:

Establishment of a negotiating team representing UCRRA to include representatives of the UCRRA Board, UCRRA Executive Director, UCRRA staff and consultants.

Establishment of a negotiating team representing the community which could consist of the following: a) the Chief Executive Officer of the Municipality or a designated Municipal Board member; b) a professional engineer hired by the Town; c) the Planning or Zoning Board Chairman of the Municipality; d) possibly, the Town Highway Superintendent, unless it is felt that the Municipal Engineer can cover the road and traffic impacts of any facility; e) one County Legislator from the district where the facility is located; f) citizens living in the immediate area (within one mile) of the proposed site, as well as citizens "at large" from the Municipality in which the facility is located. The number of citizens would be equal to the number of Municipal elected or appointed officials on the team.

The subject matter to be discussed could include, but not be limited to property tax payments; local infrastructure improvements; a payment per ton for solid waste processed or disposed of; site-specific concerns regarding environmental protection; and real property value investigation and protection.

Timing - UCRRA shall offer the generic plan to a potential host community prior to the commencement of permitting procedures pursuant to 6 NYCRR Part 360.

Negotiations - After establishment, the negotiating teams, UCRRA shall negotiate a community specific host community agreement for approval by the negotiating committee, and eventual approval and acceptance by UCRRA and the local governing body.

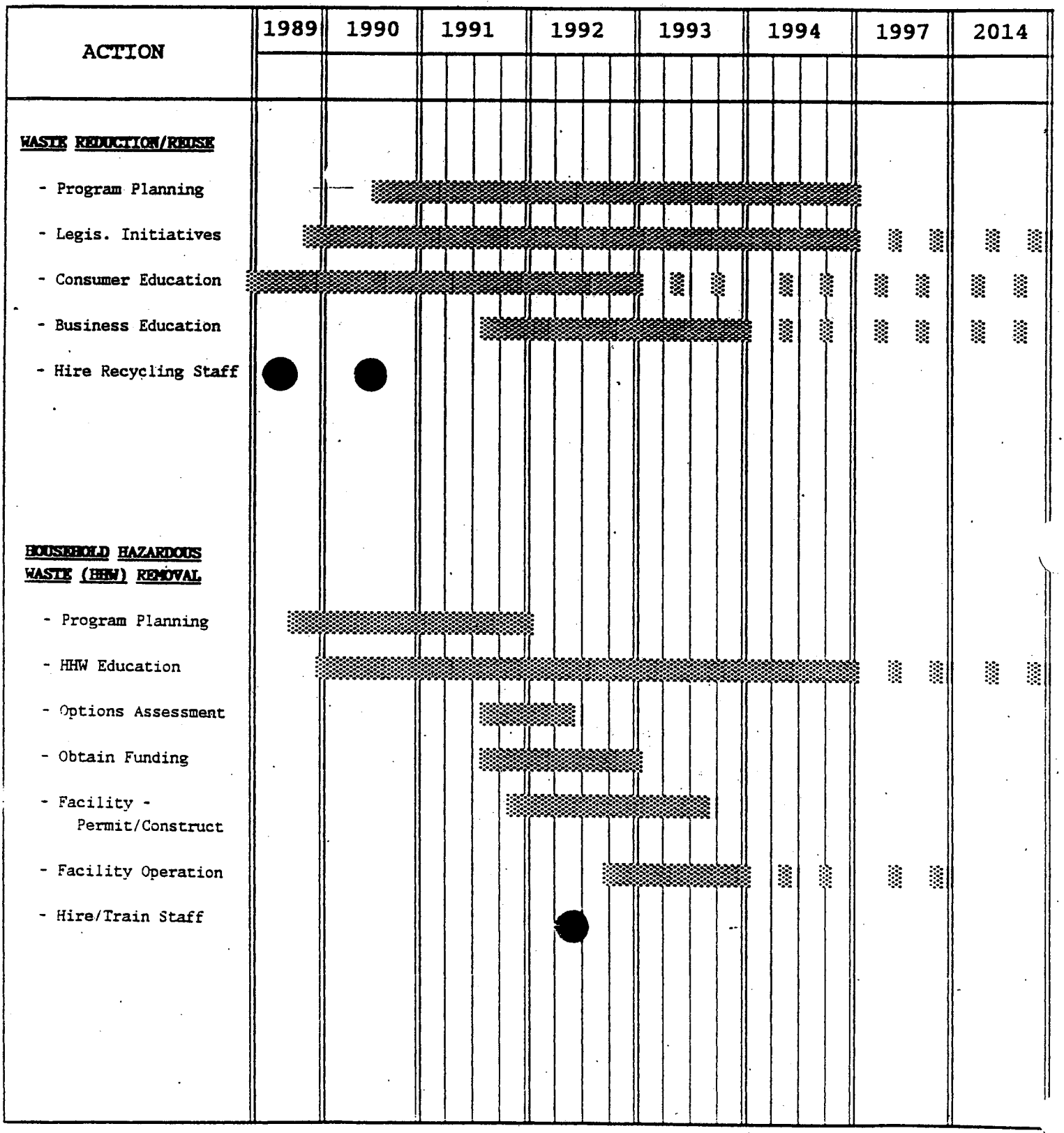
Survey Development - UCRRA finds that the development and conducting of a survey procedure would be helpful in defining issues of relevance and concern to host communities, and the County as a whole. Any such survey should be developed and conducted by a professional unbiased pollster.

There are no adverse environmental impacts to this process. Indeed, the process seeks to further identify and develop responses to specific environmental concerns in a community. The only alternative to developing a host community program is the no action alternative. UCRRA has determined that this alternative is unacceptable as it does not provide a meaningful way for a community to identify specific issues of environmental concern and to negotiate mitigation of those concerns. The host community program provides a way of developing further mitigation measures in connection with the action of the Agency.

SUMMARY ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN IMPLEMENTATION SCHEDULE

Figure 9-4 presents a summary of the Ulster County Solid Waste Management Plan Implementation Schedule from 1989 - 2014. This figure depicts the proposed schedule for implementing the major components of "The Plan". It describes in detail the actions, strategies, and time lines that must be adhered to in order to implement "The Plan" in an integrated fashion. As indicated earlier, certain elements of the recycling program have already been initiated in a manner consistent with the County's desire to maximize recycling over the life of "The Plan".

Figure 9-4
ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN
IMPLEMENTATION SCHEDULE



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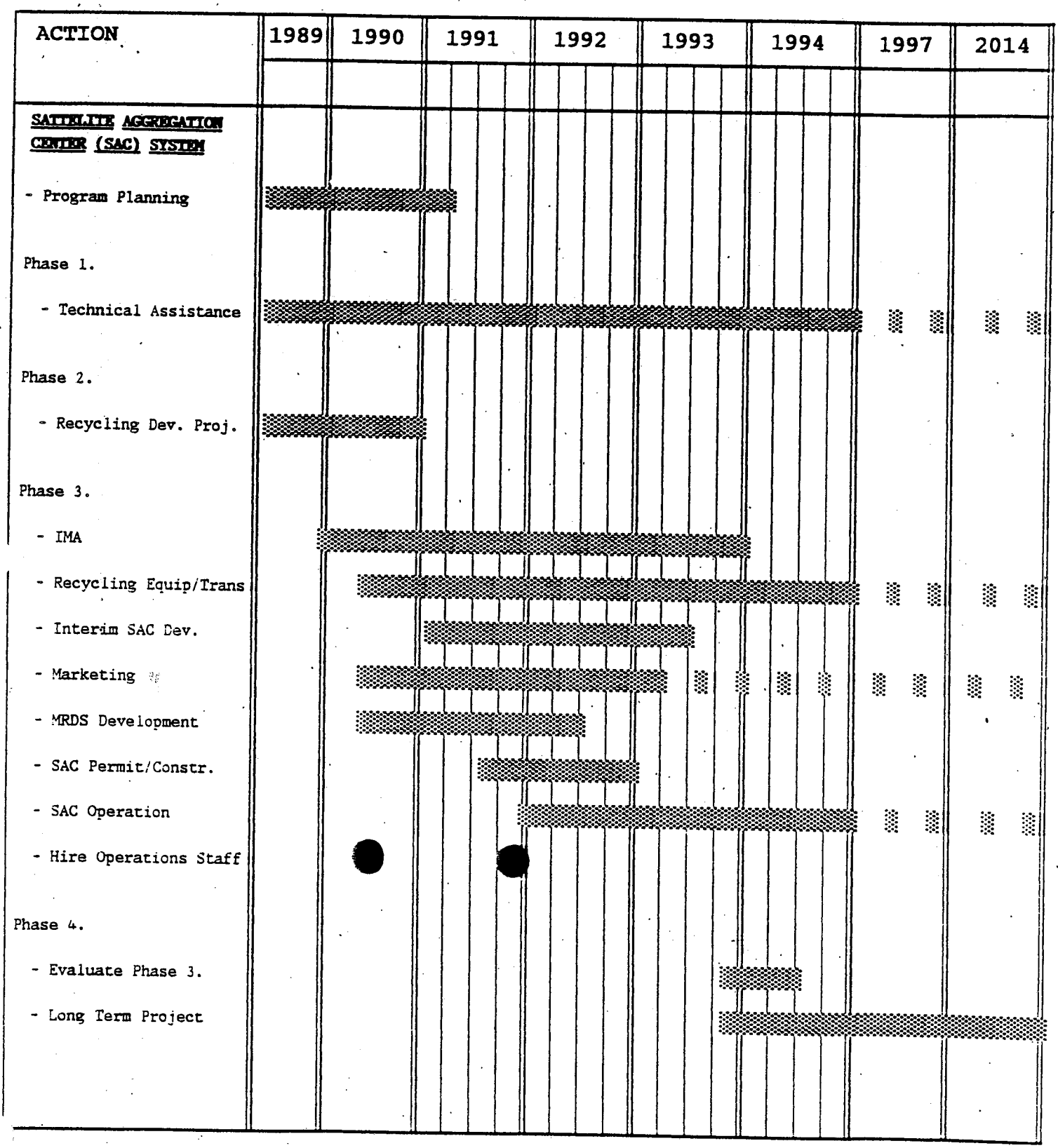

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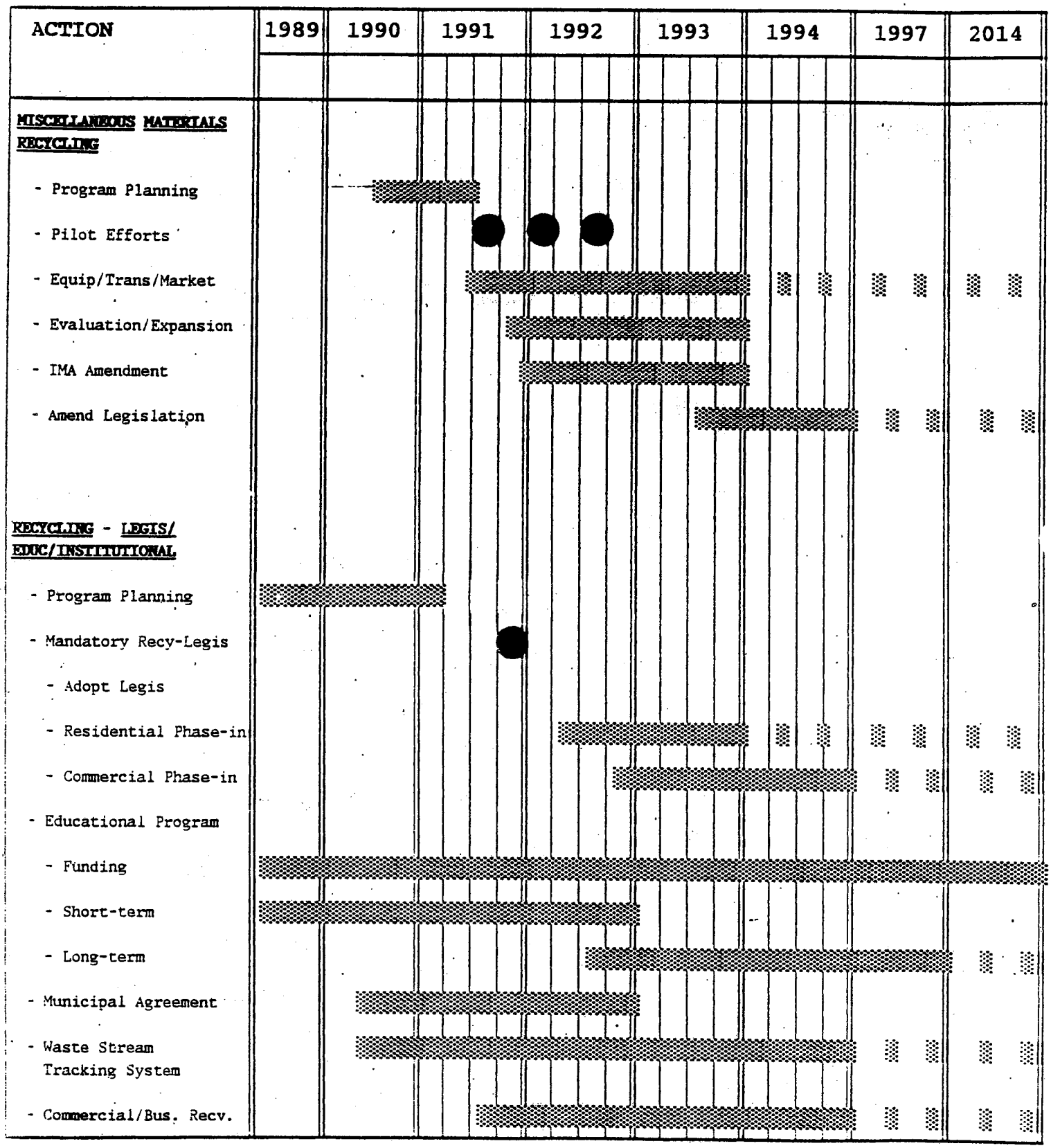
Figure 9-4 (Cont'd)



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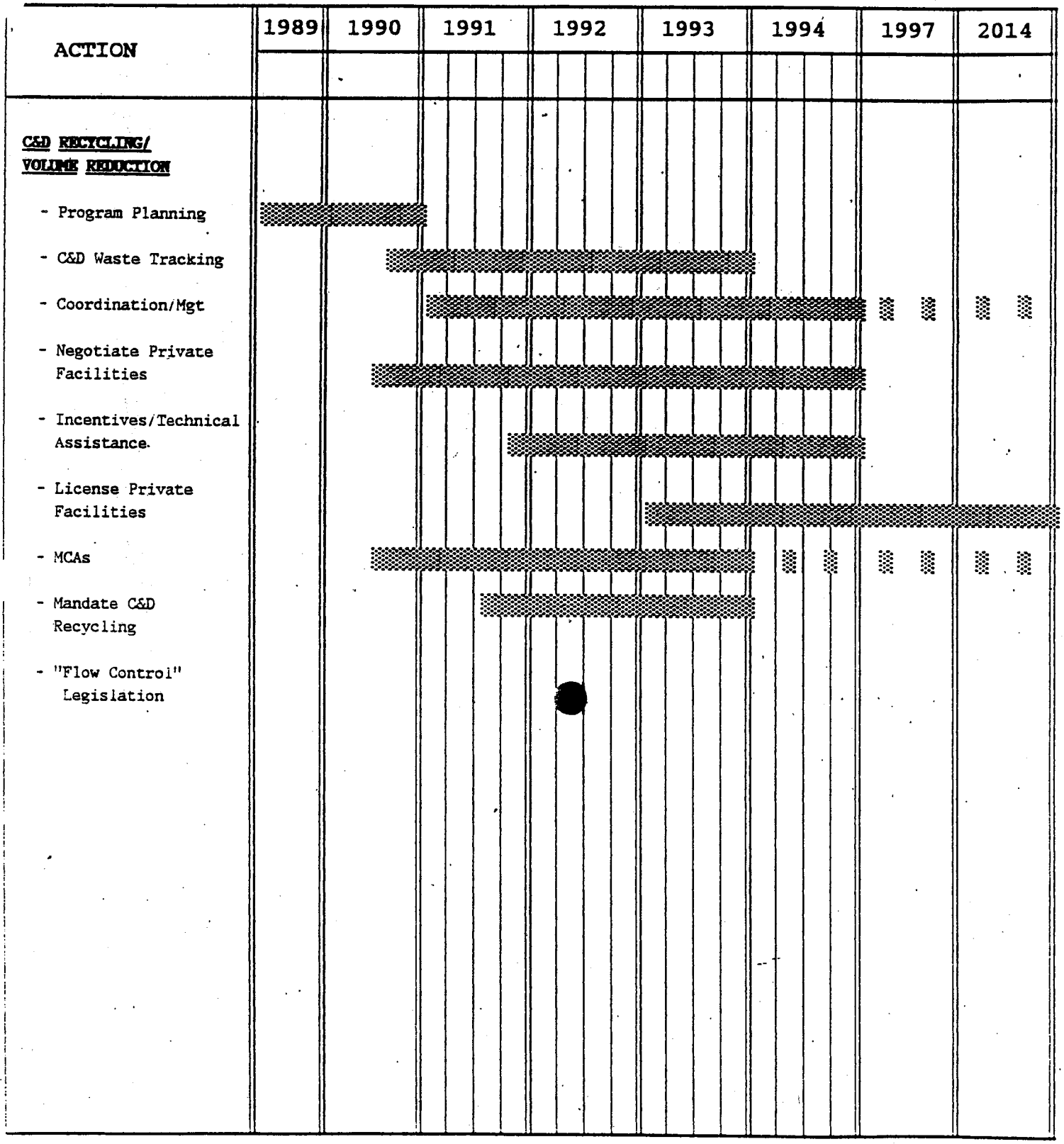

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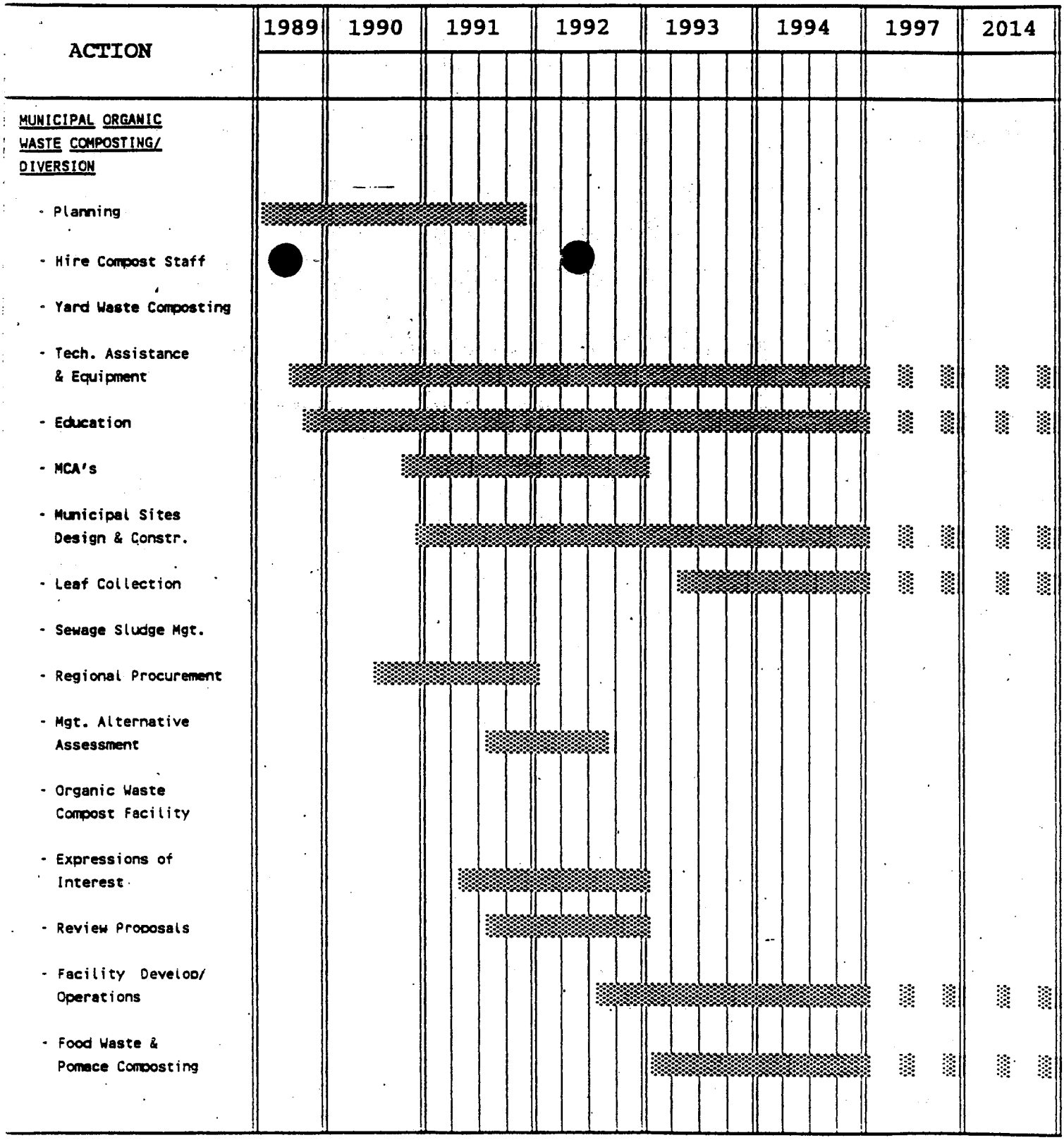

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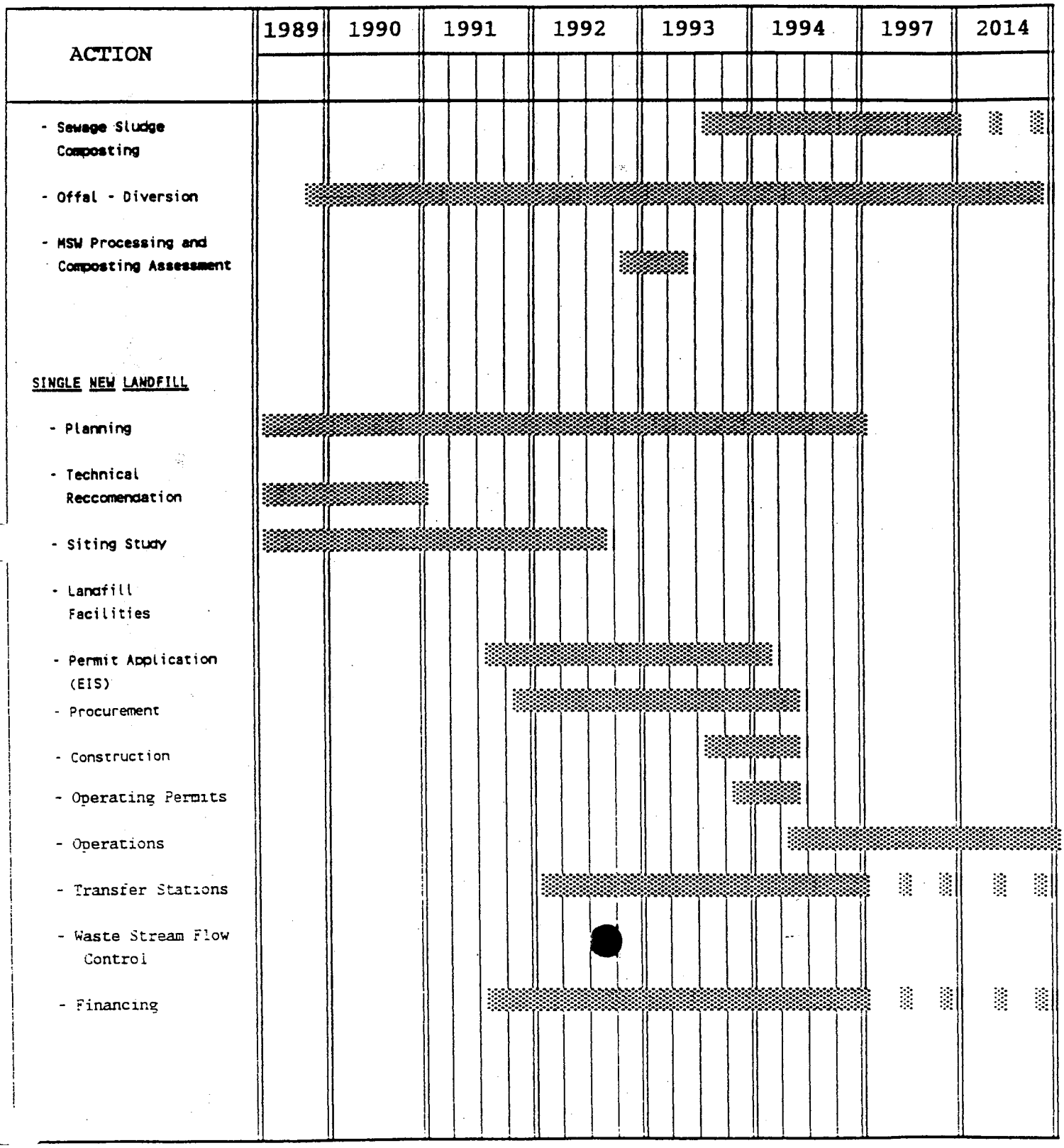

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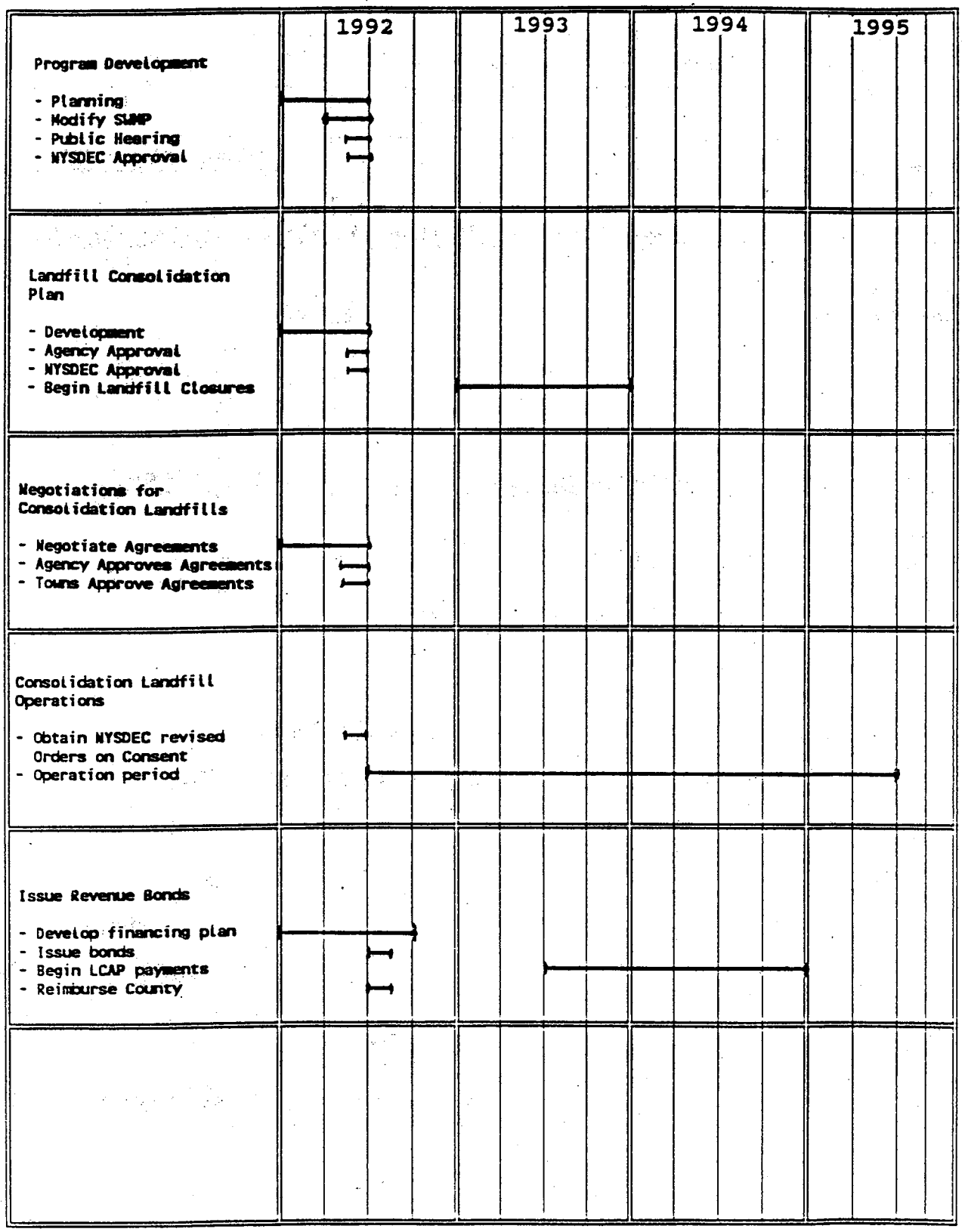
FIGURE 9 - 4 (con't)
IMPLEMENTATION SCHEDULE FOR
LANDFILL CONSOLIDATION PLAN (1992-1995)



9.6 PLAN AMENDMENT & FUTURE ACTIONS

The State Environmental Quality Review Act and the NYS Solid Waste Management Act require that generic environmental impact statements and Solid Waste Management Plan include procedures and criteria for supplements to reflect impacts, such as site specific impacts, which have not been fully addressed or analyzed in the GEIS. SEQRA further requires that such procedures shall include provision for public notice for supplements which will allow for public comment on new material presented by the supplement in the same manner that was provided in respect to the GEIS. [See 6 NYCRR Part 617.15(b).] In the section below, UCRRA establishes procedures to analyze the environmental impacts associated with future actions. These procedures will also be utilized in approving future actions and may be used when amending "The Plan". With this in mind, UCRRA finds and determines the following:

SEQRA Review Required - Specific actions to carry out the policy findings and conclusions set forth in the solid waste management plan and the Final GEIS and Supplemental Final GEIS must be subjected to meaningful public review and must be carried out in accordance with SEQRA and all appropriate permitting regulations. The process for development of future actions should follow the requirements set forth in 6 NYCRR Part 617.15.

Implementation Procedure - The following procedure satisfies SEQRA and permitting requirements and maximizes public involvement in the process:

- Identify proposed future actions and discuss the actions in public session as soon as possible.

- Provide information on the proposed future action to the Citizen's Advisory Committee.

- Analyze proposed future actions using the criteria established in SEQRA and the Final GEIS and Supplemental Final GEIS and report on the need for further study and review under SEQRA.

- If it is determined that no further SEQRA compliance is required in accordance with 6 NYCRR Part 617.15(c), then proceed by adopting, in public session, a resolution implementing the specific action.

- If a proposed future action was adequately addressed in the Final GEIS or Supplemental Final GEIS but was not adequately addressed in this Findings Statement, then proceed by adopting a supplemental Findings Statement.

- If a proposed future action was not adequately addressed in the Final GEIS or Supplemental Final GEIS, then make a determination of significance of the effects of the proposed action.

- If the proposed future action will not result in any significant effects, then prepare and approve a negative declaration.

- If the subsequent proposed action involves one or more significant environmental effects in accordance with the criteria under SEQRA and the Final GEIS and Supplemental Final GEIS, then authorize the preparation of a supplement to the Final GEIS and Supplemental Final GEIS. In such case, publicly advertised scoping sessions shall be utilized to assist UCRRA in developing a work plan for the Supplemental EIS. The Supplemental EIS shall contain a section which considers the proposed future action in light of the Final GEIS and Supplemental Final GEIS and reconciles it to the findings and conclusions set forth in the Final GEIS, the Supplemental Final GEIS, and this Findings Statement. The review shall also relate the proposed action to the solid waste management plan.

The purpose of these procedures is to ensure that future site-specific and program-specific proposed actions based upon the Final GEIS and Supplemental Final GEIS and Solid Waste Management Plan are undertaken only after full consideration of the proposed actions under SEQRA which allows for maximum public involvement.

By discussing the proposed future actions in public sessions at the earliest stages of development, the public will be assured of having adequate notice to begin to analyze proposed future actions. Proposed future actions should be discussed with the Citizens Advisory Committee as soon as possible. Adoption of this implementation methodology may help to avoid adverse environmental impacts by providing the public with early and adequate notice of actions and permitting the public to come forward, and subsequently, in formal scoping sessions to bring to the attention of UCRRA perceived adverse impacts.

There is no identified adverse environmental impact to the process described as it is intended to carry out the provisions of SEQRA and to maximize public involvement.

Alternatives Considered - The no action alternative would allow for the ad hoc review of proposed future actions. This alternative is unacceptable because it defeats the purpose of solid waste management planning and may violate SEQRA. The purpose of developing a comprehensive solid waste management program through the generic environmental impact process is to provide for a coordinated and iterative development of a comprehensive plan. The basic step of establishing the solid waste management plan has been accomplished in this initial process. Each proposed future action to implement the plan must be reviewed in order to ensure that it is in accordance with the plan, or that any variation from the plan is fully reviewed and analyzed. Ad hoc actions would not necessarily relate back to the plan and, thus, the goal of a coordinated, comprehensive development would not be achieved.

By following the process proposed herein, UCRRA will develop the plan in a manner which allows the greatest opportunity for a comprehensive, coordinated effort with meaningful public involvement.

9.7 CONCLUSION

The issuance of this "Plan" represents the culmination of over two and one-half years of work by UCRRA, its staff and consultants, County and public officials, and members of the public. The process represents a significant investment of time and money on everyone's part. But this process is just the beginning. The development of a comprehensive long-term solid waste management plan for the County is an evolutionary process. As the subject matter involved is so important to the future of the County, significant commitments of time and effort should be made by all to the next phase of the work.

UCRRA concludes that the essential policy developed in the "Plan" and Final GEIS and Supplemental Final GEIS represent an action which, after consideration of all reasonable alternatives, will avoid adverse environmental effects to the maximum extent practicable. Development of an integrated solid waste management program with strong emphasis on reduction, reuse, and recycling, composting and landfill technology to be constructed strictly in accordance with 6 NYCRR Part 360 is consistent with social, economic, and other essential considerations as it provides a safe, flexible system which protects the health and safety of the residents of the County and enhances the economic viability of the County.

By maximizing use of the SEQRA and solid waste management planning process, and by encouraging public involvement through the public process, open meetings, the Citizen's Advisory Committee, a host community program and an implementation methodology which complies fully with the letter and spirit of SEQRA, adverse environmental effects of the action will be minimized or avoided and the mitigative measures identified in the Final GEIS and Supplemental Final GEIS will be maximized.

10.0 GENERIC ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

10.1.1 POTENTIAL ENVIRONMENTAL IMPACTS

Potential environmental impacts associated with the proposed action are discussed in this section. The use of the term impact in this context is simply a recognition that the effects of the proposed action need to be considered. These "impacts" are not necessarily harmful or even "significant". This section is broad and conceptual in nature, and addresses the full range of future actions which may be undertaken by the project sponsor. Thus, the construction and operation of solid waste management facilities including landfill, composting/recycling facilities, and a waste-to-energy facility are discussed. See Chapter 5.0 of this document for a detailed discussion of the recommended technology approach for the County. Potential environmental impacts associated with the operation of each of the technologies are evaluated separately. Since this Plan considers the full range of technologies which may be implemented, the operation of a waste-to-energy facility is discussed, even though waste-to-energy technology has not been selected, and since the potential effects from ash residue disposal are different from solid waste disposal, the associated potential environmental impacts are provided. Short-term construction and long-term operation environmental impacts from the proposed solid waste management facilities will depend on the eventual implementation of the technologies and the site selected. For example, landfilling would require a detailed consideration of ground water quality impacts, whereas a combustion process would require a detailed consideration of air quality impacts.

This discussion of environmental impacts is intended to provide only a general overview of the areas of potential concern. Site and technology specific environmental impact studies need to be prepared to evaluate in detail the environmental impacts described in this section.

10.1.2 SURFACE WATER

The intent of this section is to identify facets of the construction and operation of the proposed solid waste management facilities which may adversely impact the quality or quantity of area surface waters. As concluded in this section, the risk of adverse effects as a result of development or operation of any or all of the proposed facilities is low. The primary considerations in evaluating effects were the development of a water supply, disposal of process/sanitary wastes, management of storm water runoff, the generation/disposal of leachate, and generation/deposition of fugitive ash residue emissions or dust. In many instances, existing regulations are cited which ensure the development of technologies which do not adversely affect the environment, specifically area surface waters. For example, discharge directly to a surface water body is regulated by the SPDES permit system of 6 NYCRR Part 750. Additionally, design, construction, and operation considerations are presented which will minimize or eliminate adverse effects to area surface waters.

Construction Impacts on Surface Water - Potential impacts to surface water related to the construction of any of the facilities will depend upon final site design. However, certain short-term impacts may occur as a result of storm water runoff, dewatering operations, or modification of existing surface water bodies.

Storm Water Runoff - Disturbance of soil during construction may allow for the mobilization of larger quantities of fine-grained sediment during storm events. This may increase the turbidity of storm water runoff from the site. In addition, as construction progresses, less open land will be available to allow for infiltration of precipitation. The result may be an increase in the amount of storm water runoff.

To control storm water runoff, a temporary drainage collection system may be utilized during construction, or the permanent system designed for the solid waste management facilities may be constructed early in the site development phase. The drainage collection system could be designed to direct storm water flow across the site towards retention basins. These basins would allow turbid runoff water to release its sediment load, and would then permit controlled discharge to surface water bodies or recharge to ground water. No adverse impacts to surface water are anticipated.

Dewatering Operations - It is not anticipated that construction would require major dewatering operations since the physical structures would generally be constructed above the water table. However, small scale, localized dewatering may be necessary during some parts of site development, such as construction of foundation footings. This will depend to some extent on the site developed for solid waste management facilities. This dewatering activity could be accomplished by installing a temporary pumping network at the building site which would discharge to the on-site drainage collection system described above. In this way, siltation controls would be maintained throughout the dewatering process and no impacts to surface water are anticipated.

Modification of Existing Surface Water Bodies - The existing pattern of site drainage would be considered during the design of all facilities. However, it may be necessary to modify the existing pattern to allow for complete site development. This will depend on the site developed for solid waste management facilities. Any modifications proposed for surface water bodies occurring on the site are regulated under 6 NYCRR Part 608. No modifications would be allowed which negatively impact the environment.

Operational Impacts on Surface Water - Certain aspects associated with the operation of the solid waste management facilities are evaluated with regard to the potential impact on the quality and quantity of area surface waters. Those considered are the development of a water supply, waste water disposal, storm water runoff, leachate generation, and the deposition of airborne emission particulates.

Water Supply - Water needs at the landfill and recycling/composting facilities would be limited to sanitary and minor operations, and can be estimated at approximately one to two gpm. The water demand for the composting operation would include some process water required for periodic watering of the compost piles. During the dryer periods of the year, it may be necessary to occasionally add water to the composting operation to maintain optimum moisture conditions and to minimize potential fugitive dust generation. It is estimated that this water requirement would be about 20 gallons per cubic yard (Rutgers, 1985). The need will

therefore be periodic and low on an average daily basis. The water needs of a waste-to-energy facility are generally limited to cooling, flue gas scrubbing, washdown, boiler feed, fire protection, and sanitary use. The amount of water necessary to operate a facility will depend primarily upon the cooling technology selected. Cooling systems are used in electric generating systems to cool spent steam. Several types of cooling systems are used including once through, evaporative, air cooling (which requires no cooling water) and combinations of these. Depending upon the cooling system used, the cooling water requirements can vary widely. For example, for a 250 tpd waste-to-energy facility, total water requirements may vary between 50 thousand for an air cooled system and 15 million gallons per day for a once through cooling water system. This translates into 34.7 gpm to 10,000 gpm. Ultimate selection of a cooling technology will depend in part upon the availability of an adequate water supply.

Surface water supplies in the County are the only means of obtaining the large amount of water necessary for some of the water intensive cooling water technologies, as ground water supplies are generally limited to several hundred gpm. The viability of developing a surface water supply will depend on the potential yield of the source and the pumping and treatment requirements.

Fire water supplies are generally stored in on-site lagoons or tanks for use in emergency situations.

If an independent water supply is developed, it would be regulated by the local DOH and possibly NYSDEC. The supply would be developed only if no adverse environmental impacts were anticipated and the supplying water body could support the withdrawal.

Waste Water - It is expected that only one or two gpm of sanitary and maintenance waste water would be generated at the landfill and composting/recycling facilities. This waste water could be discharged either to an existing sewage collection system for transport to a sewage treatment plant or to an on-site septic system. Sanitary waste water would not be discharged to the surface and, therefore, no impacts to surface waters would occur.

The amount of process waste water generated by a waste-to-energy facility can vary from negligible

amounts to thousands of gallons per minute, depending partly on the cooling technology employed and the degree of recycling employed in the dry scrubber and ash residue system. Sources of waste water may include boiler and cooling tower blowdown, spent water treatment regenerant solutions, rinse waters, and miscellaneous floor drainage.

Several alternatives may be considered for disposal of process waste water. If the quantity of unrecyclable waste water is limited and the quality meets sewage pretreatment standards, it may be collected in an on-site storage tank and transported off-site for appropriate treatment and disposal at a sewage treatment plant. Waste water may also be treated on-site and either transported off-site for disposal or discharged to a sewer or surface water body. Once through cooling water, if used, is generally discharged directly to the water course from which it was withdrawn. Any discharges to a surface water body are regulated under the SPDES permit system of 6 NYCRR Part 750 and would only be allowed if the surface water body can assimilate the treated waste water with no adverse environmental impacts.

Storm Water Runoff - Storm water runoff would be directed away from the landfill and composting/recycling area. Therefore, it is not expected that contaminants would be present in the runoff. Precipitation which infiltrates the composting material or landfill would be collected as leachate, described below. Land moving operations associated with landfill operations may generate fugitive uncontaminated dust which would be remobilized during storm events. Construction of the recycling or a waste-to-energy facility may increase the amount of storm water runoff at the site by making less open area available for the infiltration of precipitation. A drainage collection system could be constructed at the site to control storm water runoff. Retention basins could be constructed which allow turbid runoff water to release its sediment load, and then permit controlled discharge to surface water bodies or recharge to ground water. This drainage collection system may be regulated through the SPDES permit system of 6 NYCRR Part 750. No adverse impacts to surface waters are anticipated as a result of solid waste management facilities operation.

Leachate - Percolation of precipitation through the landfill and compost areas and periodic watering of the compost may generate leachate which would be collected by the leachate collection system. Landfill construction is regulated under 6 NYCRR Part 360. Compost leachate typically has a dark color and a relatively high biochemical oxygen demand (BOD), although it is not toxic. Leachate would only be allowed to collect in the area of compost activity, in accordance with 6 NYCRR Part 360 regulations. These regulations allow leachate to be treated by filtering through site soils. If site soil conditions are not conducive to treatment by filtration, a liner may be required to collect the leachate for treatment and discharge. This will depend on the site developed for solid waste management facilities. The leachate would then be withdrawn from the leachate collection system and, if it meets sewage pretreatment standards, transported off-site for treatment at a sewage treatment plant. If not, leachate would be pre-treated on site and conveyed off-site for further treatment. Leachate may also be fully treated and discharged directly to a surface water body under the regulations of the SPDES permit system of 6 NYCRR Part 750. Discharge permits would be issued only if no adverse environmental impacts were anticipated and the receiving water body could assimilate the discharge. No impacts on surface water are expected from leachate generation.

Disposition of Airborne Emission Particulates - The potential impacts to surface water quality as a result of disposition of airborne emissions from a potential waste-to-energy facility have been evaluated for numerous projects. For a project on Long Island, New York, Malcolm Pirnie evaluated direct deposition into a surface water body as well as deposition on the watershed and subsequent runoff into the water body. As presented in that assessment, the effects of mercury and dioxin were evaluated. Mercury was chosen because it is a pollutant emitted from facilities in relatively high amounts, it has a high bioaccumulation factor, and stringent USEPA water quality criteria exist for that pollutant. Dioxin (as 2,3,7,8-T CDD) was chosen because of its strong tendency to bioaccumulate.

The results of that study show that the predicted accumulated levels of these chemicals in the water body are well below the USEPA water quality

criteria. Other pollutants emitted in lower amounts and with less tendency to bioaccumulate would be expected to attain even lower concentrations in surface water bodies, especially with respect to less stringent USEPA water quality criteria. Although study conditions will vary from those at the site, deposition of airborne emission particulates is not expected to have a noticeable adverse impact on area surface water quality.

If a waste-to-energy facility is ever implemented, a landfill designed to receive ash from the waste-to-energy facility would also be constructed. The tendency for an ash landfill to generate fugitive dust is a function of the moisture content, density, and physical character of the bulk ash. The moisture content and density of ash will vary depending on the type of waste and the technology of the generating waste-to-energy facility. However, based on inspection of an operating ash residue landfill in Marion County, Oregon, which accepts ash residue from a mass-burn resource recovery facility equipped with dry scrubbers and baghouses for air pollution control the ash sets up into stable, hard-packed, gravel-sized material. This is due to the pozzolanic nature of the ash and the addition of lime as a part of waste-to-energy facility operations. Therefore, the character of ash residue is not generally conducive to the generation of dust. Dust generation can also be controlled by proper handling during transport and disposal operations. Therefore, the potential for the generation of fugitive ash residue dust would be negligible and no impacts to surface water quality are expected.

10.1.3 GROUND WATER QUALITY

The intent of this section is to identify facets of the construction and operation of the proposed solid waste management facilities which may adversely impact the quality of area ground water. As concluded in this section, the risk of adverse affects as a result of development or operation of the solid waste management facilities is low. The primary considerations in evaluating effects are the development of a water supply, disposal of process and sanitary wastes, management of storm water runoff, generation and disposal of leachate, and generation and deposition of fugitive ash residue emissions or dust. In many instances, existing regulations are cited which ensure the development of technologies which do not adversely affect the environment, specifically ground water. Additionally,

design, construction, and operation considerations are presented which would minimize or eliminate adverse effects to area ground water.

Construction Impacts on Ground Water - Potential impacts to ground water related to the construction of any of the facilities will depend on final site design. However, certain short-term impacts may occur as a result of storm water runoff and dewatering operations.

Storm Water Runoff - As construction progresses, less open land would be available to allow for infiltration of precipitation. The result may be an increase in the amount of storm water runoff. To control storm water runoff and to recharge precipitation to the aquifer, a temporary drainage collection system may be utilized during construction, or the permanent system designed for the solid waste management facilities may be constructed early in the site development phase. The drainage collection system would be designed to direct storm water flow across the site towards retention basins. These basins would allow controlled discharge to surface water bodies or recharge to ground water. Although "mounding" in the water table may occur below the retention basins and hydraulically downgradient of the basins, this should produce no adverse affects on the ground water. In addition, recharge from the basins would aid in returning precipitation to the aquifer which may have otherwise left the site as runoff.

Dewatering Operations - It is not anticipated that construction would require major dewatering operations, since the physical structures would generally be constructed above the water table. However, small scale, localized dewatering may be necessary during some parts of site development, such as construction of foundation footings. This will depend on the site developed for solid waste management facilities. This dewatering activity could be accomplished by installing a temporary pumping network at the building site which could be discharged to the on-site drainage collection system described above. Since ground water quality is expected to be good, recharge of this water to the retention basins is unlikely to have an adverse impact. Any lowering of the water table accompanying this withdrawal is not expected to substantially affect the ground water regime, as effects would tend to be localized, minor, and

temporary. Upon completion of the construction requiring ground water withdrawal, any dewatering activity would cease and ground water levels would be allowed to recover.

Operational Impacts on Ground Water - Certain aspects associated with the operation of the solid waste management facility are evaluated with regard to the potential impact on the quality and quantity of area ground water. Those considered are the development of a water supply, waste water disposal, storm water runoff, leachate generation, and the deposition of airborne emission particulates.

Water Supply - Water needs for sanitary and minor operations at the landfill and composting/recycling facilities can be estimated at approximately one to two gpm. The water demand for the composting operation would include minor sanitary needs if a site office is established and some process water required for periodic watering of the compost piles. During the dryer periods of the year, it may be necessary to occasionally add water to compost to maintain optimum moisture conditions and to minimize potential fugitive dust generation. It is estimated that this water requirement would be about 10 gallons per cubic yard. The need will therefore be periodic and low on an average daily basis. Adverse impacts to the available supply of the aquifer are not anticipated as a result of developing a small water supply.

The water needs of a potential waste-to-energy facility include flue gas scrubbing, washdown, boiler feed, fire protection, sanitary use, and may include non-contact cooling.

Water may be obtained from an existing public or private supply by constructing a pipeline. If possible, an independent ground water supply may be developed. Ground water supplies in Ulster County may yield up to several hundred gpm, although usually only in unconsolidated aquifers. It may only be possible to develop a bedrock ground water supply, which may have limited yield depending on site conditions. Use of a ground water supply may limit the types of feasible cooling technologies.

Development of a ground water supply would be regulated by the local DOH and possible NYSDEC. Although pumping will affect the natural hydrologic balance in the aquifer by removing stored ground

water, withdrawal would not be allowed unless it is demonstrated that the supplying aquifer is capable to supporting the withdrawal.

Adverse impacts to the available supply of the aquifer are not anticipated as a result of developing a small water supply.

If these facilities are co-located on one site the water supply needs should be integrated and recycling opportunities would be maximized.

Waste Water - It is expected that only one or two gpm of sanitary and maintenance wastewater would be generated at the landfill and composting/recycling facilities. This waste water would be discharged either to an existing sewage collection system for transport to a sewage treatment plant or to an on-site septic system. If a septic system is used, effluent would be discharged to a leaching field constructed in accordance with the published standards of NYSDEC and local regulations. Waste waters would filter through the unsaturated zone of the soils beneath the field, allowing for aerobic and anaerobic biodegradation of the effluent. Discharge in excess of 1000 gpd or generated by 10 or more workers daily is regulated by the SPDES permit system of 6 NYCRR Part 750 and allowed only if the septic system is constructed to eliminate adverse impact on the local ground water.

Both sanitary and process wastewater would be generated by a waste-to-energy facility, although process wastewater would not constitute the major portion. The amount of process wastewater generated by a facility can vary depending upon the cooling technology and the degree of recycling employed. Process wastewater may be disposed of by pre-treating, if necessary, and transporting off-site for treatment or by discharging to a surface water body under the SPDES permit system of 6 NYCRR Part 750. None of the alternatives considered for process wastes are expected to impact ground water.

It is expected that only one to two gpm of sanitary wastewater would be discharged, either to an existing sewage collection system for transport to a sewage treatment plant or to an on-site septic system. Septic system disposal was discussed in the previous section.

Storm Water Runoff - Storm water runoff would be directed away from the landfill and composting

facilities to prevent contact with compost and landfilled materials. Therefore, contaminants present in these materials are not expected to be present in runoff and adverse impacts to ground water quality are not anticipated as a result of the recharge of storm water runoff to the aquifer.

Construction of recycling and waste-to-energy facilities may increase the amount of storm runoff at the site by making less open area available for the percolation of precipitation. As described previously, a drainage collection system would be constructed to control storm water runoff. Retention basins would be constructed which allow turbid runoff water to release its sediment load, and then permit controlled discharge to surface water bodies or recharge to ground water. Although "mounding" in the water table may occur below the retention basins and hydraulically downgradient of the basins, this should produce no adverse affects on the ground water. In addition, recharge from the basins would aid in returning precipitation to the aquifer which may have otherwise left the site as runoff. The control of storm water runoff may be regulated under the SPDES permit system of 6 NYCRR Part 750.

Leachate - Construction and operation of landfills are regulated under 6 NYCRR Part 360, which requires the total isolation of leachate from the ground water system. Leachate generation would be minimized by maintaining a small working face area during disposal operations, directing storm water runoff away from the working area, and placing daily, intermediate, or final cover material, as appropriate, soon after the filling operation is completed in each area.

The landfill liner system would be constructed to retain all leachate generated during the site operations. Collected leachate would be immediately withdrawn from the leachate collection system to minimize hydrostatic pressure on the landfill liner. If the leachate meets sewage pretreatment standards it would be transported off-site for treatment at a sewage treatment plant. If not, leachate would be pre-treated on site and conveyed off-site for further treatment. Although leachate would not be permitted to enter the ground water system and no impacts to ground water quality are expected, ground water in the vicinity of the landfill would be monitored through a network of monitoring wells installed in accordance with 6 NYCRR Part 360 regulations.

Infiltration of precipitation and periodic watering of compost may generate leachate. This leachate typically has a dark color and a relatively high BOD, although it is not toxic. Leachate would only be allowed to collect in the area of compost activity, in accordance with 6 NYCRR Part 360 regulations. If site soil conditions are appropriate, these regulations allow leachate to be treated by infiltrating the soils, allowing for physical filtration and biological degradation. Under this method of treatment, the depth to the water table must be sufficient to allow for adequate cleansing before leachate recharges the ground water. If site soil conditions are not conducive to treatment by infiltration, a liner may be required to collect the leachate for treatment and discharge.

Deposition of Airborne Emission Particulates - The potential impacts to surface water quality as a result of the deposition of airborne emissions from a waste-to-energy facility are discussed in Section 10.1.2. These impacts are expected to be negligible. The impacts on ground water are expected to be further reduced over those in surface water. Several natural processes would act to minimize the potential for the pollutants to migrate to the water table and affect ground water quality. The degree of effect of these processes would be dependent on the site conditions, but in general, physical and chemical binding forces will limit the downward movement of pollutants to approximately 15 to 30 cm. Volatilization, photo-degradation, microbial degradation, and scour from surface water runoff will also act to reduce the concentrations of pollutants in the soil. Therefore, it is unlikely that sufficient concentrations of pollutants will be able to reach the water table to adversely affect the ground water quality of the site.

A landfill designed to receive ash from a waste-to-energy facility would be constructed if waste-to-energy technology is implemented. The pozzolanic properties of ash and the addition of lime as a part of waste-to-energy facility operations tend to generate an ash residue that is table, hard-packed, and gravel-sized. Therefore, the character of ash residue is not generally conducive to the generation of dust. Dust generation at the landfill can also be controlled by proper handling during transport and disposal operations. Since the potential for the generation of fugitive ash residue dust would be negligible, no impacts to ground water quality are expected as a result of leaching of the dust at the landfill.

10.1.4 HEALTH EFFECTS

This section summarizes potential human health hazards associated with various solid waste management technologies including composting/recycling facilities, landfilling, and waste-to-energy facilities. These issues would be developed in detail and evaluated in subsequent site and technology specific environmental impact studies. While potential hazards are identified, state-of-the-art engineering designs would be employed to minimize environmental release and transport of contaminants in solid waste, ash, and air emissions. Human exposure, and consequently, human health risk would be minimized.

Landfilling - Landfilling may be required for residential and commercial non-hazardous solid waste disposal, bypass waste, and or residue ash from a potential waste-to-energy facility. The greatest health hazard from landfilling has historically been the potential for chemical leaching from the landfill into underlying ground water and the migration of chemical contamination to potable surface and ground water supplies.

Engineering design requirements for new landfills and the expansion of existing landfills are expected to reduce greatly the potential for environmental contamination. As specified in 6 NYCRR Part 360-2.13, engineering controls include the interception, collection, and treatment of stormwater runoff and leachate. Engineering designs also provide controls for the generation of methane and other landfill gases, reducing potential hazards from inhalation. Daily placement of cover over the landfill can also discourage habitation by small mammals and other potential disease-carrying animals.

Recycling and Composting - Health hazards commonly associated with the disposal of solid waste stem from the potential for chemical leaching from a waste or ash landfill, as described above, or the emission of particulate or gaseous contaminants from a potential waste-to-energy facility. Neither of these is associated with a materials recovery facility. The recycling of common residential and commercial items such as cans, paper, glass, and cardboard does not pose health hazard to the general population, but rather, serves an important function in lessening the volume of raw waste

requiring disposal. In addition, the recycling of wastes such as plastic, oil, batteries, and tires, among others, lessens the potential for these wastes to contribute contaminants to leachate or emissions associated with other disposal methods. Composting of leaf and yard wastes does not pose a health hazard for the general population.

Waste-to-Energy - Airborne contaminants may be released in stack emissions from a potential waste-to-energy facility in particulate or gaseous forms. Resultant contaminant concentration in air may be inhaled directly by persons downwind from such a facility. Emitted contaminants may also be deposited to the ground surface downwind from such a source. Deposited contaminants could then accumulate in shallow soil layers, be transported to nearby surface water bodies, and dissolve and leach into underlying aquifers depending on the chemical and physical properties of the contaminants and regional soils. Direct deposition of emitted contaminants on vegetation and into surface water bodies may also occur. Individuals may then be exposed through drinking water supplies, consumption of fish, local produce and livestock, or incidental contact with soils.

Air pollution controls to be incorporated into any waste-to-energy facility proposed for the County would minimize the potential for the spread of airborne contaminants to the surrounding environment and nearby residents. Most gaseous and particulate emissions would be captured before release into the atmosphere. In addition, all facility operations would comply with state and federal regulations.

Potential health hazards may arise from fugitive dusts generated from ash handling and disposal. Any such hazards would be localized. Engineering controls designed to minimize fugitive dust generation include, but are not limited to, ash quenching, covering transportation vehicles, or providing daily cover and portable windbreaks.

10.1.5 NOISE

New sources of noise are regulated by federal, state, and local authorities. A brief discussion of applicable regulations is presented below. This is followed by a discussion on the noise impacts during construction and operation of the facilities. In summary, noise impacts from construction would most likely be noticeable but

within the range of NYSDEC allowable urban noise levels. Facility operations are not expected to generate noticeable noise impacts.

Applicable Noise Regulations and Guidelines - The primary intention of the Federal Noise Control Act of 1972 is to promote an environment free from noise, thereby protecting human health and welfare. Although this Act gave primary responsibility for noise control to state and local governments, the USEPA has authority to set noise emission standards for new facilities that are considered major sources of noise. The USEPA has adopted noise regulations for selected equipment and machinery including new portable air compressors, newly manufactured medium and heavy trucks, and interstate motor and railroad carriers.

The USEPA has also established day-night energy equivalent noise levels, which represent levels that protect public health and welfare with a margin of safety. For residential areas, the USEPA identified a Ldn (weighted average day-night noise level) equal to or less than 50 dB(A) as a level below which there is no reason to suspect that the general population will be at risk from any identified effects of noise. This value, however, is not meant to be considered as a standard or regulation.

In accordance with NYSDEC 6 NYCRR Part 360-1.14(p), solid waste management facilities are prohibited from producing excessive sound levels beyond the property line at locations where residential properties exist or where property is zoned for residential development. Noise levels at these locations shall not exceed the Leq statistical sound levels (a noise level that is exceeded for 10 percent of any one hour period) described in Table 10-1.

These regulations specify that if the background ambient sound levels excluding any noise contribution from proposed facilities already exceed the specified limits, facility operations shall not cause an increase in the background level.

All internal combustion-powered equipment are required to have mufflers, and sound levels for this equipment shall not exceed 80 dB(A) at a distance of 50 feet. Ulster County does not have noise ordinances, according to the County Health Department. It is the responsibility of the local towns and villages to establish laws concerning noise.

TABLE 10-1

SOLID WASTE MANAGEMENT FACILITY NOISE LEVELS(1)

Character of Community	Allowable Noise Levels(2) Time of Day 7 a.m. to 10 p.m.	10 p.m. to 7 a.m.
Rural	57 dB(A)	47 dB(A)
Suburban	62 dB(A)	52 dB(A)
Urban	67 dB(A)	57 dB(A)

Notes:

(1) Source: 6 NYCRR Part 360-1.14(p).

(2) Standards apply to locations in use or permitted to be used for residential purposes.

Construction Impacts - During the construction phase, the major source of noise will be from equipment powered by internal combustion engines. The equipment usage and activities will vary spatially and temporally. Accordingly, sound levels and noise effects will also vary. Thus, it is difficult to predict precisely the total impacts of all construction equipment due to the variability of the number and type of sources operating at any given time. Impacts from construction will also be reduced due to a site's proximity to major roadways and its contribution to the existing ambient noise.

Typical ranges of energy-equivalent noise levels for particular operations at a construction site are presented in Table 10-2. Values for industrial facilities are considered most applicable to this action. Generally, activities utilizing earth moving equipment, such as front end loaders and tractors, generate the most noise. The primary noise source from the operation of this equipment is the internal combustion engineer, which is used for both propulsion and powering working mechanisms. The typical operating cycle of earth moving equipment involves several minutes at full power followed by several minutes at a lower power.

TABLE 10-2

TYPICAL RANGES OF ENERGY-EQUIVALENT NOISE LEVELS IN dB(A) AT CONSTRUCTION SITES

	Domestic Housing		Office Building, Hotel, Hospital, Schools, Public Works		Industrial, Parking Garage, Religious, Amusement and Recreation, Store, Service Station		Public Works, Roads and Highways Sewers, and Trenches	
Phase	I(1)	II(2)	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	83	84	84
Excavation	88	75	89	79	89	71	88	78
Foundations	81	81	78	78	77	77	88	88
Erection	81	65	87	75	84	72	79	78
Finishing	88	72	89	75	89.	74	84	84

Notes:

(1) All pertinent equipment present at site.
(2) Minimum required present at site.

Source: Canter, L.W., 1977.

An estimate of the noise level generated at a distance of 50 feet from the equipment is shown on Figure 10-1 and ranges from 72 to 96 dB(A).

For materials handling equipment, such as cranes and concrete mixers, the dominant source of noise is also the engine and it is generally used in a fixed location. Stationary equipment (e.g., pumps, generators) run continuously at relatively constant power and speed, although sound levels may vary according to the work cycle or leading. Common construction equipment noise ranges are presented in Table 10-3 and Figure 10-1.

Based on monitoring conducted during construction of waste-to-energy facilities, maximum noise levels can range from 94 to 96 dB(A) at a distance of 50 feet from the combined noise source. Noise associated with construction of the recycling building is included within these limits.

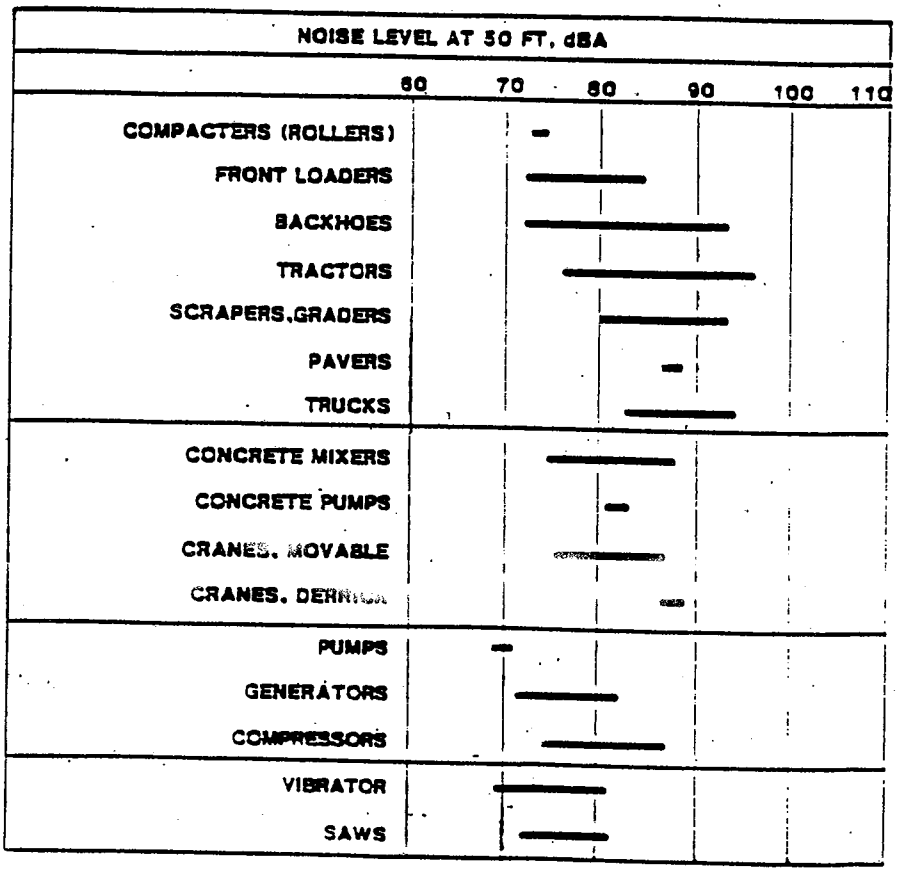
A hypothetical worst case situation can be analyzed involving the use of ground clearing and excavating equipment assuming a scraper, backhoe, and two trucks each at 85 dB(A); two front-end loaders each at 80 dB(A); and a bulldozer at 89 dB(A). Table 10-4 presents a methodology for determining cumulative noise impacts from more than one source and a listing of the dissipation of noise levels as a function of increasing distances from a point of source. The highest noise level experienced in this worst case is 89 dB(A) from a bulldozer. Utilizing Table 10-4, the four pieces of equipment each at 85 dB(A) would add a total of 6 dB(A) (4 x 1.5 dB(A)) to the highest noise level experienced. The two front end loaders would each add 0.4 dB(A). The resultant noise level in and around the site (at a distance of 50 feet from the noise source) under these conditions could reach as high as 95.8 dB(A) (89 + 6 + 0.8 = 95.8 dB(A)).

TABLE 10-3

COMMON CONSTRUCTION EQUIPMENT NOISE RANGES
(dB(A))

Equipment	Noise Level at 50 Feet		
	Low	Mid-Range	High
Backhoe	72	85	93
Compressor, Stationary	68	80	87
Compactors	72	80	88
Concrete Mixer	72	80	90
Concrete Pump	75	80	85
Crane, Movable	75	80	85
Crane, Stationary	80	85	90
Dozer	84	89	94
Front Loader	72	80	96
Generator; Stationary	70	75	85
Jack Hammer	75	90	98
Paver	82	85	92
Pneumatic Wrench	82	86	90
Pump, Stationary	69	70	80
Rock Drill	80	85	95
Saws	67	80	94
Scraper or Grader	76	85	95
Tractor	73	85	96
Trucks	70	85	96
Vibrators	70	75	82

FIGURE 10-1



Source: Canter, L., 1977

CONSTRUCTION EQUIPMENT
NOISE RANGES

Noise levels resulting from construction activities will dissipate with distance from the noise sources. Additionally, intermediate barriers located between the source and the receptor will absorb or obstruct the noise. Point source propagation of sound is defined by the inverse square law, which equates to a decrease in sound level by 6 dB(A) for every doubling of distance. Utilizing the hypothetical worst case situation just discussed, if a construction noise level of 95.8 dB(A) is measured 50 feet from the point source, noise levels approximately 2,000 feet away are estimated to be approximately 65 dB(A) excluding intermediate barriers.

TABLE 10-4

METHOD FOR DETERMINING CUMULATIVE NOISE LEVELS

Differences Between Noise Levels, dB(A)	No. of dB(A) to be[1] Added to Higher Level
0	3.0
1	2.6
2	2.1
3	1.8
4	1.5
5	1.2
6	1.0
7	0.8
8	0.6
10	0.4
12	0.3
14	0.2
16	0.1

Noise Level Dissipation with Distance

dB(A)s @ 50' From Point Source Noise	Dissipation of 50' Noise Levels with Distance					
	100'	200'	400'	800'	1600'	3200'
70	64	58	52	46	40	34
75	69	63	57	51	45	39
80	74	68	62	56	50	44
85	79	73	67	61	55	49
90	84	78	72	71	65	59
95	89	83	77	71	65	59
100	94	88	82	76	70	64
105	99	93	87	81	75	69

(1) Source: Canter, L.W., 1977.

During the construction phase, the transportation of construction workers to and from the site and the delivery of equipment and materials may have an effect on noise levels. These impacts would be temporary in duration and most likely would not be noticeable.

Operational Impacts Associated with Landfill - Several activities typical of landfill operations contribute to noise levels. Noise sources at a landfill typically include solid waste carting and landfill operational equipment used to excavate and transport cover material, unload bales, perform compaction operations at the face of the landfill, and provide site road maintenance. Truck traffic, release of air brakes, and packer ejection mechanisms during truck dumping all contribute to the noise level in the landfill. Noise will also be generated at off-site locations by trucks delivering solid waste to the site. Noise levels from medium to large trucks average 80 to 95 dB(A) (Canter, 1977) at a 50 foot distance. An increase in traffic volume is expected once the proposed action is implemented; therefore, traffic related noise levels should increase in the immediate vicinity of the site when the facilities are in operation. However, due to the site's proximity to the major roadways and its con[illegible]tion to the existing ambient noise, the overall perceptible operational impacts may be reduced.

Operational Impacts Associated with Recycling - Noise sources associated with recycling include trucks entering and exiting the facility and any equipment utilized to [illegible]e and process the recycling material. This is dependent on facility design. Front end loaders, shredders, balers, separators, and conveyors are some of the machinery that may be used in the facility.

Carting vehicles delivering the recyclables for processing or transporting them to market would be travelling adjacent to the facility. If processing operations take place inside the facility, noise impacts will be reduced. With indoor operations and a large buffer area available on-site, noise associated with the previously mentioned activities is not expected to be noticeable at the nearest receptor.

Operational Impacts Associated with Composting - Noise sources associated with composting are comprised of carting vehicles delivering

compostable materials to the site, and equipment used to turn the compost piles. Most of these same carting vehicles would be travelling to the adjacent landfill. Similarly, because of the large amount of buffer area available on-site, noise associated with equipment operation involved in the periodic turning of the piles is not expected to be noticeable at the closest off-site residential location.

Operational Impacts Associated with Waste-to-Energy - For a waste-to-energy facility the major process noise sources are the solid waste handling, combustion, electric generation, air pollution control, cooling, and ash residue handling systems. Noise levels reported by manufacturers for industrial equipment are typically measured in an open, flat area at a distance of 50 feet from the component source. Most equipment in waste-to-energy facilities is enclosed, thereby muffling the resultant outdoor noise levels. Noise attenuation by enclosures is dependent upon such factors as the materials utilized in construction of the enclosing building. Theoretical estimation of noise attenuation without actual field measurement is difficult.

Figure 10-2 presents a range of noise levels for a variety of industrial machinery and equipment. Combustion furnace, turbine generator, fans, and pumps are typical components of the combustion system of a waste-to-energy facility, while blowers and pumps are found throughout the facility. Based upon the available data for current operating facilities, the following component noise generation rates have been estimated in Table 10-5 to determine noise impacts from an operational facility.

The typical noise levels presented are at a distance 50 feet from the component source and considering building wall transmission losses resulting from component enclosures in a building or structure. Noise transmission losses due to the building structure can range from 20 dB(A) to 45 dB(A) depending on the interior and exterior building materials utilized (American Industrial Hygiene Association, 1975). An average transmission loss of 30 dB(A) was utilized in this table except for the refuse and residue handling areas. Therefore, building attenuation is not as great. For refuse handling areas, an average loss of 20 dB(A) was reported assuming roll-up doors are utilized for passage of trucks. The air condensers

TABLE 10-5

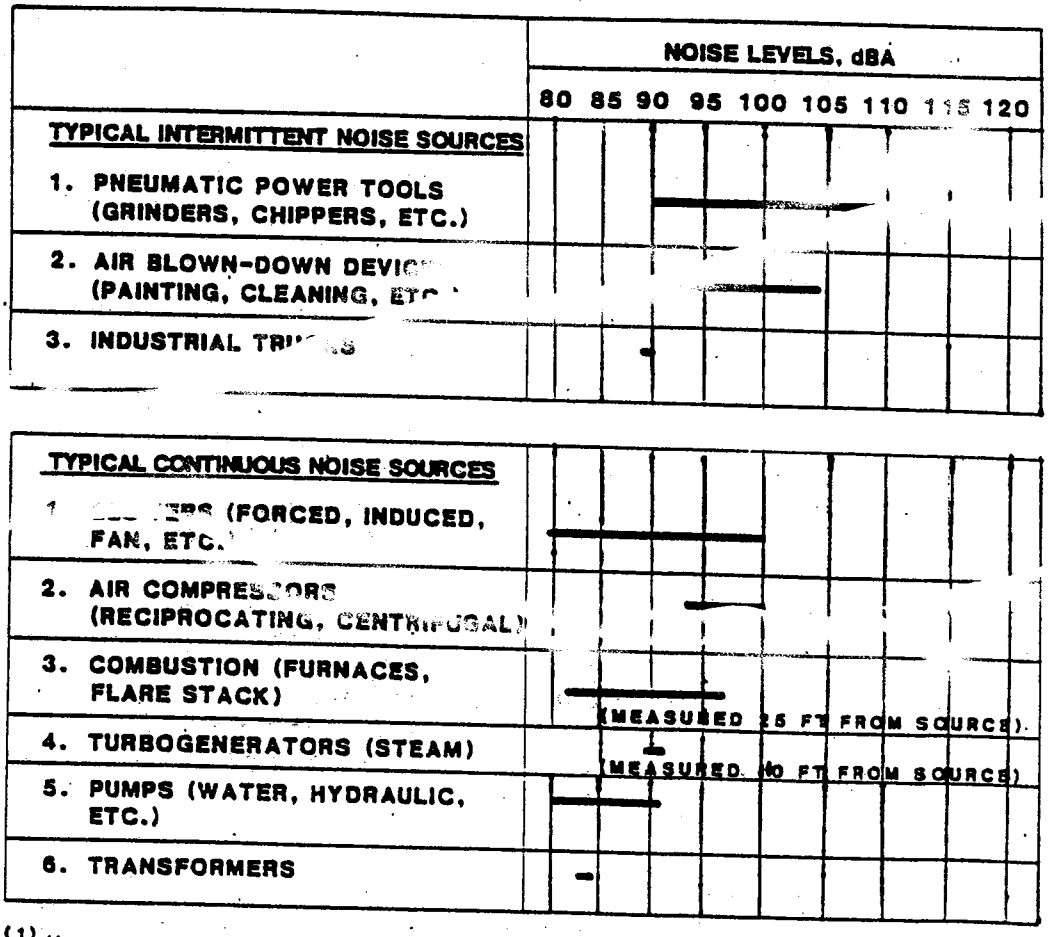
COMPONENT NOISE SOURCES

Component	Average L_{50} at 50 foot Reference Distance dB(A)	Average L_{50} Including Building Wall Transmission Loss of 30 dB(A)
Refuse Handling[1]	66	46
Combustion	61	31
Electric Generation	66	47
Air Pollution Control	66	36
Residue Handling	61	41
Air Condensers[2]	66	66

Notes:

(1) A building wall transmission loss of 20 dB(A) was used due to periodic free passage of noise through open access doors.
(2) Equipment is located outdoors so building loss was not included.

FIGURE 10-2



(1) Measured at operator positions, except for combustion and turbogenerators

Source: Canter, L., 1977

INDUSTRIAL MACHINERY, EQUIPMENT AND PROCESS NOISE RANGES MEASURED AT OPERATOR POSITIONS[1]

are usually outside so no building attenuation is considered for that component.

The estimated combined noise level of these components at a 50 foot distance is 72 dB(A). By using the linear formula for noise dissipation, facility noise levels of approximately 48 dB(A) would be added to the ambient level at a distance 800 feet from the center of the facility. Although site-specific measurements would be required to quantify the impact of the facility operations on the ambient noise levels, it most likely would not result in a perceptible increase in noise levels.

10.1.6 SOIL EROSION AND SEDIMENT CONTROL

The construction and operation of the proposed facilities would result in increased soil erosion and sediment movement on site. Generally, this would occur during the construction phase, which would have a short-term (approximately one to two years) duration. Landfill construction would occur in phases. Once construction is complete, erosion originating from the operation of the proposed facilities would not be noticeable.

Construction Impacts - Overland runoff of precipitation over exposed surfaces (non-vegetated or unpaved) can result in soil erosion and an associated increase in sediment load to receiving surface water bodies and storm water drainage systems. To minimize these effects, soil erosion and sediment control practices would be implemented during the construction phase.

The greatest amount of soil erosion is expected during the initial site preparation, when existing vegetation and topsoil would be cleared during grading activities. As required to achieve final site grades, clean fill will be used to prepare the facility site for construction of buildings and roadways. Earth moving activities and temporary on-site soil stockpiles provide potential sources for soil erosion. Depending on the site developed and the layout on that site, it may be necessary to import soil to produce the required soil depth to bedrock or groundwater as specified is 6 NYCRR Part 360.

Short-term impacts of soil erosion during the construction phase cannot be avoided, but can be minimized by providing control methods for surface drainage and soil movement. These control methods include: construction of diversion channels and/or sedimentation basins for runoff collection,

cleaning excessive mud or soil from construction vehicles as they leave the site, and the use of vegetated/lined drainage ditches and hay bales or stone-lined berms to control and decrease runoff water velocities and filter sediment. In addition, the construction practice of vegetating exposed soils as soon as practicable to minimize potential erosion may be used to control surface drainage and soil movement.

Operational Impacts - Erosion originating from the operation of recycling, composting, and waste-to-energy facilities would not be noticeable since these operations would not involve excavation activities. However, soil erosion and sediment movement would occur with the operation of a landfill since the operation involves earth moving activities. These activities include preparation of the landfill cell, as well as excavation for and storage and application of cover material. In addition, truck movement across unvegetated soil surfaces can contribute to soil erosion and movement. The mitigation measures of such activities would be similar to those associated with facility construction.

10.1.7 ODOR, LITTER, VECTORS AND FUGITIVE DUST

Nuisance impacts are associated with virtually all solid waste management activities, primarily from the refuse delivery vehicles. The degree of these impacts are technology and site specific. This section identifies the potential impacts associated with construction and operation of landfill, recycling, composting, and waste-to-energy technologies.

Construction Impacts - Odors and vectors originating from construction operations would not be noticeable since the materials used are not putrescible organic materials. Any litter generated by construction would be controlled by good housekeeping practices.

During the construction phase, fugitive dust emissions may occur as a result of construction related activities. These activities include earth moving and excavation for foundations and site drainage, pipe/trench excavation, landscaping, and vehicle movement over unpaved and unvegetated surfaces. Furthermore, the construction site would contain several temporary, unpaved haul roads. These roads would be generally used by the earth

moving equipment (e.g., bulldozers, dump trucks, front-end loaders), employee vehicles, and delivery trucks traveling to and from the site. This movement could cause fugitive dust emissions if the soils at the surface are sufficiently dry. Even though fugitive dust emissions may impact air quality it would only last the duration of the construction phase.

Operational Impacts Associated with Landfill - Odors emanating from municipal solid waste (MSW) landfills have historically been a concern to nearby sensitive receptors. These odors have occurred when the landfill has not been operated in a truly sanitary manner, which requires that the solid waste is consistently covered with clean fill. However, a properly operating new landfill can be expected to have good odor control. Fugitive dust resulting from operation of the landfill may occur as a result of earth moving and daily cover of the fill. Impacts would be similar to that experienced during construction - see previous section.

In general, vectors have posed some problems for landfills that were not operated properly. Methods used to mitigate vector problems include good housekeeping, extermination, and frequent cover with cover material. Thus, if the new landfill is properly designed and operated, it is not expected that any potential vector problem would be noticeable at off-site locations.

Facilities processing solid waste can create litter if not properly maintained. The design and operation of the landfill facility would promote good housekeeping practices, such as promptly covering the solid waste with fill before it is transported by wind currents and becomes an off-site problem. Additionally, vehicles transporting solid waste to the landfill would be appropriately covered to prevent blowing paper and litter.

Operational Impacts Associated with Recycling - Odors originating from the recycling operation would not be noticeable, since the recyclables do not typically include putrescible organic materials.

Fugitive dust emissions may occur as a result of vehicular traffic to and from the solid waste management facilities. However, if transfer stations are utilized, vehicular traffic would be

minimized such that fugitive dust emissions are not expected to substantially impact air quality. Furthermore, paving of access roads and internal roadway to the other solid waste management facilities would reduce fugitive dust emissions to unnoticeable levels.

For a recycling operation, it is generally assumed that a vector problem will not be a major one since the operation does not deal with putrescible organic materials. However, a possible area for vector activity is in the recyclable storage area. Vector control in this area can be readily accomplished due to quick marketability of the materials and design measures such as totally enclosing the building and keeping garage doors to the tipping floor area closed during periods when the recyclables are not being delivered. For a recycling operation, it is not expected that a vector problem would be noticeable at off-site locations if the facility is designed and operated properly.

Facilities processing recyclables can create litter if not properly maintained. Enclosure of the recycling processing components, especially the tipping floor, can minimize potential impacts due to litter.

It is expected that the design and operation of the recycling facility would promote good housekeeping practices, such as promptly removing litter dropped on the tipping room floor before it is transported by wind currents and becomes an external litter problem. Additionally, vehicles transporting recyclables to the facility will also be appropriately covered in order to prevent blowing papers and litter.

<u>Operational Impacts Associated with Composting</u> - A problem associated with all types of composting facilities continues to be the generation of odors. This is particularly true when the composting operation uses open or unconfined systems or if the compost is not allowed to stabilize for a sufficient amount of time. Usually the odors are confined to the site but adverse conditions such as warm, humid, or calm periods can cause odors to migrate. These odors can be minimized by proper design and operation of the compost system as well as providing an adequate buffer zone between the compost site and residential areas so that most of the odor problems may be mitigated. It is therefore expected that any potential odor effects

from the composting facility would not be noticeable at off-site locations.

During a typical operating day, fugitive dust emissions may occur as a result of vehicular traffic into and out of the facility. Fugitive dust emissions are not expected to substantially impact air quality. Additionally, fugitive dust may occur if the stabilizing compost piles become unusually dry. However, if periodic watering is implemented, it is expected that fugitive dust generation from the composting facility would not be noticeable at off-site locations.

The composting operating area has historically posed problems in terms of vectors. There are two primary areas for vector activity: the solid waste and compost storage areas, and the composting operation area. The use of open or unconfined piles of stabilizing compost have attracted vectors. However, this problem can be minimized by proper design and operation of the compost system. Enclosing the operation or periodic turning of open compost piles can help prevent breeding in the compost operation areas.

Thus, it is expected that any potential vector problems within the composting facility would not be noticeable at off-site locations if facilities are designed and operated properly.

Enclosure of the compost facilities, especially the stabilizing compost piles, can minimize potential impacts due to litter. The design and operation of the compost facility promote good housekeeping practices, such as promptly removing litter dropped on the tipping floor before it is transported by wind current and becomes an external litter problem. Additionally, vehicles transporting solid waste and/or compost to the facility will also be appropriately covered so the materials would be confined to prevent blowing papers and litter.

Operational Impacts Associated with Waste-to - Energy Facility - Odors associated with successfully operating waste-to-energy systems have been minimal. This is primarily due to the combustion process which destroys putrescible material in the solid waste. Stack emissions from the facility do not produce odors that would affect the surrounding communities. Additionally, operation of a waste-to-energy facility substantially reduces the amount of putrescible solid waste landfilled, thereby reducing a potential source of odor.

Two potential sources of odor emissions for a waste-to-energy facility can occur during the transport of solid waste to the site and subsequent storage of solid waste in the solid waste pit. Potential odors originating from the transport of solid waste can be minimized through the use of enclosed carting trucks. Maintaining negative pressure in the solid waste pit and drawing air through the combustion chamber will also prevent outside migration of odors from raw solid waste.

In general, a positive overall effect upon odor quality is expected from a waste-to-energy facility and the elimination of solid waste landfilling as the primary method of solid waste disposal.

During a typical operating day, fugitive dust emissions may occur as a result of employee vehicles and delivery trucks traveling to and from the site. Paving of access roads will reduce fugitive dust emission to unnoticeable levels.

For a waste-to-energy facility, the [illegible]mate area for vector activity is in the sol[illegible] waste storage area. Vector control in this [illegible] readily accomplished due to quick [illegible] the solid waste supply, desi[illegible] co[illegible], such as concrete walls to prevent penetration by ve[illegible], and housekee[illegible] measures, such as keeping garage doors to the tipping floor area closed du[illegible] periods when the solid waste [illegible] not being delivered. It is not expected that vector problems from a waste-to-energy facility would be noticeable at off-site locations if properly designed and operated.

All facilities processing solid waste can create litter if not properly [illegible]ntained. Enclosure of waste-to-energy proc[illegible] [illegible] es[illegible]ly tipping floor and solid wa[illegible] pit, can mini[illegible] potential impacts due to lit[illegible] control in a waste-to-energy fac[illegible]ty [illegible] be readily accomplished by good [illegible]usekee[illegible] practices, such as promptly removing li[illegible] dropped on the tipping floor before it is tra[illegible] by wind currents and becomes an extern[illegible] litter problem. Additionally, vehicles transpo[illegible] solid waste to the facility would also be appr[illegible] [illegible]ely covered so the solid waste would be con[illegible] to prevent blowing papers and litter.

Bypass/ash materials will result from operations o a waste-to-energy facility and would require landfilling. Since ash contains very little, if any, putrescible materials, odors emanating from

the landfill as a result of ash disposal are not expected. Assuming that putrescible bypass waste would constitute up to 5 percent of the processible waste stream, then approximately 20 tons per year of bypass would be entering the landfill. Best management practices would reduce odors to levels which are not expected to be noticeable at off-site locations.

For a landfill accepting ash residue, mitigating measures may be required to avoid fugitive dust generation. These mitigation measures would be incorporated into the design of the ash residue transport practices and into the operational procedures used at the landfill.

In general, the amount of fugitive dust generated and dispersed in the handling of ash residue is dependent upon many factors including:

- Size of ash residue particulates
- Moisture content of the ash residue as it leaves the waste-to-energy facility and is unloaded at the landfill
- Pozzolanic properties of the ash residue
- Transport practices used with ash residue
- Fill operations, such as areas of ash residue remaining uncovered and length of time of exposure, vehicular movement over exposed ash residue for compaction and regrading activities, and degree of tracking of ash residue from the fill area to on-site roadways by allowing delivery vehicles to travel over exposed ash residue
- Wind speed moving across the surface of the fill.

The general practice used to control fugitive dust is to combine the ash with lime and water at the waste-to-energy facility. This results in a hard-packed material similar to low strength soil cement. After the material dries, it tends to settle and crumble into gravel size chunks that are too large and heavy to be potential fugitive dust particulates. As a result, the potential for fugitive dust emissions from the landfill is expected to be minimal.

Mitigation measures will also be employed to assure control of fugitive dust emissions during ash transport and unloading. Carting trucks would be covered and washed to remove any ash residue from

the vehicles body or tires before leaving the facility site. Delivery vehicles at the landfill would be directed to unload in such a manner that the vehicles would not tread on the exposed ash residue but rather the cover materials, thereby minimizing fugitive dust generation.

Due to the procedures that would be implemented, it is expected the losses of ash residue during transport and disposal operations would be negligible thereby minimizing ash residue fugitive dust emissions.

10.1.8 TRAFFIC

Short-term impacts from the construction activities are site specific and are anticipated to be minimal. Construction worker traffic could probably be absorbed into local peak traffic period patterns since all candidate sites are located adjacent to state highways.

A detailed traffic impact analysis will be performed for any chosen technology at the chosen facility site.

10.1.9 ARCHAEOLOGICAL AND HISTORIC RESOURCES

The impacts of construction and operation of the solid waste facilities on archaeological and historic resources were assessed for each of the candidate sites. These are discussed below.

In the event that a previously unknown site of historic interest is uncovered during construction, evaluation of the need for a subsurface archaeological excavation would be performed. Discussions would be held with [illegible] State agencies, such as the State Historic Preservation Office (SHPO), to evaluate the relative significance of the site and, as appropriate, to undertake measures to recover the site intact or consider alternative measures. If a survey were determined to be appropriate, [illegible] recovering the data would be developed with the guidance of the SHPO, and data would be evaluated to determine eligibility for inclusion on the National Register. If a site was found to be eligible for National Register status, the effects of construction and implementation of the project would be assessed by the USEPA and the SHPO.

10.1.10 ECOLOGICAL RESOURCES

Short term impacts on ecological resource are expected from construction of solid waste management facilities. The specific impacts would depend on the site developed. Constructing on an undeveloped site would remove those lands from use by wildlife and eliminate the habitat. Long-term impacts would result from this permanent removal of land used as wildlife habitat. Since the landfill is expected to be implemented in phases, not all the site would be developed at once, therefore leaving a buffer area intact. The impacts on terrestrial and aquatic flora and fauna are site dependent and will be evaluated in detail in the site and technology specific environmental impact study to be prepared after this GEIS.

10.1.11 SOCIO-ECONOMICS

The proposed solid waste management action will provide an essential service to Ulster County. A long-term solid waste management system will enable the County to begin to address the solid waste management problem in the County and, through a properly developed host community program, may even create an overall benefit to the Municipality in which it is developed. A host community agreement should be developed with the Municipality in which the preferred site is located and this should include certain benefits such as a per ton payment to the host community for use of the site.

Aesthetics - Aesthetic impacts during construction should be similar to those of any major development, and may include disruption of visual continuity due to excavation areas, equipment and construction material laydown areas, and operation of heavy equipment. Fugitive dust during construction may also produce aesthetic impacts.

Long-term impacts due to operation of the facilities would be site dependent to a large extent. Consideration would be given towards maintaining and enhancing the aesthetic quality of the site selected for development. The facilities would be carefully designed to promote an overall attractive visual impression of the area. Studies on aesthetics/visibility will be conducted for a future site specific EIS.

10.1.12 AIR QUALITY IMPACTS

Short-Term Impacts - Short-term impacts which could be attributed to construction of the solid waste management facilities include site preparation requiring earthwork that may increase heavy equipment exhaust and fugitive dust. Since a low density of vehicles would be operating, vehicle exhaust is not expected to cause unacceptable impacts.

Long-Term Impacts from Operation - Long-term impacts which could be attributed to operation of the solid waste management facilities would primarily be the transport of refuse to the landfill. The hauling trucks will create fugitive dust, however the impacts can be minimized and contained on site.

If a waste-to-energy facility were implemented, air quality impacts must be evaluated according to site specific conditions. The impacts evaluated would consist of:

- Ambient Air Quality Standards
- PSD Increments
- Visibility
- Vegetation and Soils
- Growth

10.1.13 CONCLUSIONS

A number of impacts associated with the construction and operation of solid waste management facilities have been identified in this section. All of these impacts can be eliminated or reduced to acceptable levels with the implementation of appropriate measures. Impacts include air, soil, surface and ground water, ecologic resources, human receptors, health, noise, aesthetics, odor, vectors, litter, dust, traffic, archaeologic and historic resources, and socioeconomic of the host community. These impacts can be reduced to insignificant levels through the implementation of sound planning, engineering controls and best management practices.

The minimal adverse impacts will be more than offset by the beneficial impacts to be derived by the development of the solid waste management facilities. The most obvious benefit is the provision of an essential service, i.e., a safe, reliable, environmentally sound means of managing the solid wastes for the County.

10.2 MITIGATION MEASURES

This section addresses possible measures to mitigate potential adverse environmental effects described in Section 10.1. Since no specific facility site is discussed in the Plan, the mitigation measures presented in this section are generic.

It should be noted that the technologies and site, when selected, are in themselves mitigation measures. They would be designed to avoid the unacceptable environmental impacts associated with the continued landfilling of solid waste at existing municipal landfills not in compliance with State solid waste management rules and regulations.

All of the adverse environmental impacts discussed in Section 10.1 can be mitigated to some extent. Some impacts can be mitigated through design, construction, and testing of solid waste management facilities.

On December 31, 1988, new Part 360 regulations became effective for solid waste management facilities. These new regulations reflect the trend toward increasingly strict controls on such facilities. The Part 360 regulations improve solid waste management by providing consistent, predictable rules for design, construction, operation, closure, and monitoring of facilities, and by requiring consideration of the entire solid waste management system. Part 360 safeguards the environment and public health by requiring hydrogeologic investigations and groundwater protection measures, state-of-the-art construction, stringent operation and maintenance standards, increased monitoring, and expanded status reporting on solid waste management facilities.

A landfill developed for this project would, at a minimum, meet the requirements of Part 360-2 which regulates the siting, design, construction, operation, closure and post-closure activities of landfills. This would include double composite liners and dual leachate collection and detection systems.

The following sections discuss the mitigation measures which could be implemented to reduce or eliminate the impact.

10.2.1 SURFACE AND GROUND WATER CONTROLS

This section identifies mitigation measures to reduce adverse environmental impacts on the quality and/or quantity of surface and ground water as a result of

implementation of the proposed project. Preliminary analysis of the potential impacts resulting from the construction and operation of solid waste management facilities in Sections 10.1 and 10.2 showed that the risk of adverse effects to surface and ground water is low. Design, construction, and operation considerations would minimize or eliminate adverse effects. In addition, regulations are cited which assure the development of facilities which do not adversely affect surface and ground water. This section summarizes surface and ground water control measures.

Construction Controls - Stormwater runoff control practices would be implemented to control natural on-site stormwater runoff and minimize potential off-site effects, including flooding from the facility site area. The existing site drainage patterns would be considered during the design of all facilities.

Disturbance of soils during construction may result in mobilization of larger quantities of fine-grained sediment during storm events. Soil erosion control techniques would be implemented. For example, hay bales could be placed along drainage areas to reduce sediment transport. In addition, as construction progresses, less open land would be available for the infiltration of precipitation, resulting in increased runoff and less recharge to ground water. To mitigate these effects, a drainage collection system would be constructed. The system would be designed to direct storm water flow across the site to retention basins, where turbid runoff water could release its sediment load and recharge the ground water. If dewatering is required during construction operations, the ground water would be discharged to the retention basins, as well.

Operational Controls

Water Supply - Water needs at a landfill or recycling facility are expected to average only one to two gpm. Water needs at a composting facility are expected to be periodic and low on an average daily basis. The water requirements of a waste-to-energy facility can vary from less than 50 to more than 10,500 gpm, depending primarily on the cooling technology selected. If an independent surface or ground water supply is developed for these requirements, it would be regulated by the local DOH and reviewed by NYSDOH and NYSDEC. Environmental impacts are not anticipated as a result of developing a small water supply for a recycling/composting facility or landfill.

Diversion or withdrawal of surface or ground water would not be allowed unless environmental impacts are not anticipated and the supplying water body or aquifer can support the withdrawal.

Waste Water Disposal - Process waste water from a recycling facility may be combined for pretreatment with process waste water from a waste-to-energy facility. On-site pre-treatment with discharge to a surface water body has the potential to impact surface water. However, discharge to a surface water body will require a NYSDEC discharge permit and would only be allowed if the surface water body could receive the treated waste water with no adverse environmental impacts. Process waste water generated at a waste-to-energy facility can vary from negligible amounts to thousands of gallons per minute, depending on the cooling technology employed and the amount of water recycled.

Only one to two gpm of sanitary waste water is expected to be generated at the landfill, recycling, and composting facilities assuming approximately 10 employees at each facility. The quantity of sanitary waste water generated at a waste-to-energy facility will depend on the number of employees. Each worker generates approximately 25 gpd. Sanitary waste water may be discharged to an on-site septic system, constructed in accordance with NYSDEC and local regulations. Sanitary discharges in excess of 1,000 gpd or generated by 10 or more workers daily would require a NYSDEC discharge permit unless the septic system design eliminates significant impact on ground water. No sanitary waste water discharge to surface water is anticipated.

Leachate generated by the infiltration of precipitation through a landfill or composting facility will be collected for proper treatment and disposal. Construction and operation of these facilities would be designed to direct stormwater runoff away from waste materials to minimize the quantity of leachate generated and any adverse impacts of leachate to surface or ground water. If site conditions permit, natural treatment of the compost leachate by soil infiltration may be allowed.

Storm Water Control - The development of the facility site would include paved surfaces and structures that would increase storm water runoff volumes. To compensate for this increased volume, a storm water drainage collection system could be designed and constructed to direct all of the storm

water from rooftops, structures, and paved surfaces, as well as most of the runoff from unpaved areas in the facility site area, into an on-site retention basin. Dust generated by earth moving operations during landfilling or composting would settle out in the retention basin.

Implementation of this storm water control method would serve a two-fold purpose. Since ground water is an important natural resource, the basin would represent a mitigation measure to direct storm water runoff, particularly from paved developed areas, into the ground water aquifer. In addition, the basin should reduce site surface runoff and avoid any potential flooding off-site.

Landscaping unpaved areas of the facility site will incorporate vegetative cover and conform with acceptable soil erosion and sedimentation control measures. Final site grades will be sloped appropriately to direct runoff into the recharge basin. The retention basin should be constructed at the outset of site construction so that it will be available and capable of avoiding storm water runoff impacts during construction and operation.

With implementation of a storm water drainage collection system, storm water retention basin, and landscaping of unpaved areas, there are not expected to be any adverse impacts associated with storm water runoff.

10.2.2 NOISE

Measures to mitigate noise effects from construction and operation activities can be employed. Vibration reduction, enclosure of the noise source, and absorption by natural and man-made barriers should aid in controlling noise emissions from the site.

To reduce construction noise impacts, all mechanical equipment should be maintained in good working condition, thereby minimizing engine noise. Efficient mufflers should be included on all mobile equipment such as bulldozers, trucks, and cranes. Stationary equipment can be quieted by use of enclosures or by shutting down equipment down, instead of allowing them to idle when not required to work. If possible, haul routes would be located behind natural earth berms or embankments, and noisy activities would be conducted during the time of day when background ambient sound levels are high.

Landscaping along the boundaries of the facility site can be incorporated into the design to aid in noise abatement. Vegetative buffers, particularly evergreens, are highly effective in attenuating noise levels. In addition to mitigating noise levels at the site boundaries, such plantings would have aesthetic value.

It is possible that the processing activities at the recycling facility would be enclosed, including the tipping area. Many of the building design features noted above will be incorporated to attenuate noise levels from recycling and composting operations. This design should mitigate any potential off-site noise resulting from recyclables processing.

To minimize noise impacts from landfilling and composting operations, measures discussed above for reducing construction noise impacts could be implemented. Combined with landscaping features, these measures should mitigate off-site impacts of noise from these facilities.

Once solid waste activities commence operation, noise produced from traffic in and around the site, specifically from truck queuing and frequent stopping and starting of refuse hauling vehicles, could be minimized by proper dispatching and vehicle flow control at the weighing station and in the refuse handling area.

Noise reduction for the operational phase of a waste-to-energy facility would include special considerations, particularly in the tipping floor/refuse storage pit area. Generally, most activity would occur between the hours of 6 a.m. and 4 p.m. daily, when the garage doors are open. Here, and throughout a waste-to-energy facility or a materials recovery facility, noise abatement could occur through the specification and installation of low noise-producing equipment. Where applicable and practicable, noise emitting equipment and components would be enclosed. Absorption materials, silencers, barriers, mufflers, vibration dampers, and insulation should be installed on or around any continuous or intermittent noise sources.

With the implementation of the noise mitigation measures described herein, noise levels reaching off-site receptors should not be noticeable.

10.2.3 HOUSEHOLD HAZARDOUS WASTE CONTROL

It is anticipated that operation of the proposed solid waste management facilities will include a number of household hazardous waste mitigation measures. This Plan (see Section 9.3.2 of this document) includes a number of hazardous waste mitigation measures for control of HHW including:

- Public education
- Household hazardous waste collection and disposal
- Operator training.

Emphasis is on removing HHW materials from the waste stream prior to delivery to the solid waste management facilities.

Typically, public education programs advise the public on the household hazardous materials that should be removed from the waste stream. These materials may include oven cleaner, drain cleaner, oil-based paint, chemical fertilizer, weed killer, antifreeze, batteries, furniture polish, and more. Periodic collection days are scheduled, and the public is advised on the time and locations for the delivery of these hazardous materials.

Operators at the solid waste management facilities will be trained to identify and remove any suspected hazardous wastes or other unacceptable materials during operation of the solid waste management facilities. These materials may be segregated, stored on-site in a secure manner, and ultimately disposed of at a permitted hazardous disposal facility.

The Ulster County Environmental Management Council - Household Hazardous Waste Task Force (Task Force) has prepared a report entitled Report to the Ulster County Legislature Community and Environmental Affairs Committee dated February 6, 1989 and is included as Appendix I. of the DGEIS.

The implementation of a HHW management program involves a number of benefits and risks that should be considered by the County. The benefits of such a program include safer operation and reduced environmental impacts associated with solid waste management facilities. As a result, the potential costs associated with environmental impacts (such as leachate generation, treatment, and disposal as well as air emissions and residue disposal) could be reduced since many of the materials that involve sophisticated and costly treatment and disposal would be removed from the waste stream.

The major risk associated with implementing such a program includes the liability associated with the collection, transportation, and disposal of the household hazardous waste. The sponsors of a HHW collection program are considered to be the generator of the hazardous materials collected and disposed of and as such could be involved in liabilities arising from improper handling or disposal of the materials.

As part of the implementation of the Plan, the UCRRA will

implement a HHW collection program that would be coordinated with the Ulster municipalities. In this type of program residents would be notified of the collection date and would transport the materials to the collection center. At the collection center, the materials would be segregated and prepared by a private company under contract to the UCRRA for transport to a permitted hazardous waste disposal facility.

10.2.4 LOSS OF HABITAT

The development of the solid waste disposal facilities will require a total of approximately 250 acres of land. The loss of habitat will depend on the site developed for solid waste management facilities as well as the layout on that site. Approximately 100 acres would be the footprint, however, the landfill would be developed in phases; therefore, not all the landfill area will be developed at once. In addition, the project site will include a buffer area. Evaluations of the selected site would be performed in subsequent site and technology specific environmental impact studies. This would determine what types of ecological communities exist and the potential associated impacts of the development of that site. Should a loss of valuable habitat occur during development of the facilities, a mitigation plan would be developed to compensate for that loss. This plan would be reviewed by the appropriate agencies prior to construction.

10.2.5 TRAFFIC

Traffic impacts will depend on the site developed for solid waste management facilities; therefore, they cannot be quantified at this time. Subsequent site and technology specific environmental impact studies to be performed later would determine any necessary mitigation measures associated with traffic impacts. In general, truck traffic should be distributed and routed to minimize impacts on the local communities. An evaluation of existing traffic conditions should be used in the development of a truck routing plan.

10.2.6 AESTHETICS

Since a site has not been selected and no preliminary design or layout has been developed for the proposed solid waste management facilities, mitigation measures regarding aesthetics are generic in nature. Adequate

buffers should be included in the final design, the extent of which will be a function of the land use in adjacent areas. An attempt would be made to design the facilities to be consistent with the design of surrounding structures, where possible. Considerations should be given to the facility layout to take advantage of existing screening and provide an aesthetically pleasing environment.

10.2.7 AIR QUALITY

The degree of impact, if any, from operation of solid waste management facilities on existing air quality would be directly related to the technology selected for waste disposal. Potential impacts on air quality are discussed in detail in Section 10.1, and are concerned primarily with emissions from potential waste-to-energy facilities. As described in Section 10.1, all major sources of air pollution are subject to a number of air quality regulations that seek to limit the impact of the source on ambient air quality. In addition, state-of-the-art methods of reducing air emissions should be incorporated into the design of the facility to meet and/or exceed the requirements of any necessary air quality permits.

Fugitive dust emissions may occur as a result of vehicular traffic to and from the solid waste management facilities. Fugitive dust resulting from operation of the landfill may occur as a result of earth moving and daily cover of the landfill. However, the use of transfer stations would minimize the impact of fugitive dust since greater volumes of materials would be transported in fewer vehicles. Fugitive dust may also occur as a result of stabilization, compost piles becoming dry. However, if periodic watering is implemented, it is expected that fugitive dust generation would not be noticeable at off-site locations.

10.2.8 LAND USE

Mitigative measures which may be deemed necessary to reduce impacts to land uses located adjacent to the chosen site have not been specifically identified since they would depend on the site selected for development. However, all necessary precautions will be taken to create compatible land uses and to reduce any aesthetic impacts which may be incurred. Examples of mitigative measures which may be incorporated during the design of the solid waste facility include landscaping plans and vegetative buffers.

The development of a County solid waste management facility is in itself a mitigation measure. The reliance on landfilling at the existing 15 landfills would be consolidated at one location, thereby reducing the amount of land used for solid waste management activities. Additionally, the landfill would be developed in phases, with only a limited portion of the landfill active at any given point in time.

10.3 UNAVOIDABLE ENVIRONMENTAL IMPACTS

Based on an assessment of potential environmental impacts described in Section 10.1 and the mitigation measures described in Section 10.2, implementation of the proposed action substantially eliminates potential adverse environmental impacts associated with continuing the use of existing landfill operations. Additionally, reusable materials and possible energy would be recovered from solid waste through operation of the proposed recycling and composting facilities, and waste-to-energy facility, it implemented in the future. Positive effects, such as direct and indirect benefits of increased employment from sales and income gains, will also be realized by the local area. A general discussion of potential unavoidable adverse impacts of the proposed facilities is presented below. Subsequent site and technology specific environmental impact studies would describe in detail any potential environmental impacts associated with development of the project.

10.3.1 UNAVOIDABLE CONSTRUCTION IMPACTS

All potential construction impacts associated with the proposed facilities would have a short-term (approximately one to two years) duration.

Construction activities may generate impacts resulting from excavation such as noise, fugitive dust, soil erosion, and engine exhaust fumes. Vegetation will be removed during construction resulting in the removal of some natural wildlife habitats. Construction activities will also make the area surrounding the facility site less suitable for wildlife. Aesthetically, the appearance of the site during construction will not be as appealing as the completed landscape. It should be noted that construction of the landfill would occur in phases; therefore, landfill construction would occur periodically during the life of the project.

Increased short-term employment of workers will be required during the construction phase, resulting in both direct and indirect economic benefits to the communities surrounding the site.

10.3.2 UNAVOIDABLE IMPACTS FROM OPERATIONS

Water Use - The water supply sources and the quantities needed for the proposed facilities have not yet been determined and would be discussed in subsequent site and technology specific environmental impact studies. It is expected that there would be no unavoidable environmental impacts resulting from water withdrawal and use because technologies would be developed in accordance with the federal, state, and local regulations that serve to protect water resources. All aspects of solid waste facility development including the design, construction, and operation considerations would serve to minimize or eliminate any adverse effects on water sources as a result of facility construction and operation.

Water Quality - The quality, quantity, and disposition of waste water to be discharged from the proposed facilities have not yet been determined. This information would be developed in future stages of project development. It is expected, however, that there would be no adverse environmental impacts resulting from these discharges since all discharges would be treated in accordance with local, state, and federal requirements that regulate waste water discharges and protect the quality of receiving water bodies. All waste water would be treated on-site and/or at a sewage treatment plant prior to discharge.

Traffic - There would be an increase in traffic in the vicinity of the facility site. The extent of this increase would be determined in future detailed traffic studies to be conducted in subsequent site and technology specific environmental impact studies.

Noise - As described in Section 10.1, off-site noise generation from the operation of solid waste management facilities would be within established guidelines. Noise impacts would be discussed in greater detail in subsequent site and technology specific environmental impact studies. Noise control measures would be implemented to mitigate noise production.

Air Quality - Based on the results of the technology evaluation contained in this GEIS, the recommended solid waste management technologies for the County are landfilling in conjunction with recycling/composting. Although a waste-to-energy facility is not being planned at this time, on-site operations affecting air quality associated with a waste-to-energy facility would not create harmful effects to the environment or humans.

Aesthetics - Unavoidable impacts to existing aesthetics would depend on the site developed for solid waste management facilities, the layout on that site, as well as the technology(ies) selected for development. The design of the solid waste management facilities would incorporate aesthetic considerations to blend structures with the visual characteristics of the surrounding areas.

10.4 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Natural and manmade resources would be consumed or made unavailable for future use with development of the solid waste management facilities. Although there are resources that would be irreversibly committed to the implementation of the facilities, the benefits accompanying the replacement of existing landfilling practices with the proposed technologies will result in an overall environmental benefit.

This discussion primarily focuses on those resources that will be committed to the construction and operation of the solid waste management facilities. Based on the technology evaluation, the recommended technologies are landfill and compost/recycle. While waste-to-energy is not recommended, this section discusses the commitment of resources for all facilities discussed previously and include land, water quality and usage, energy and materials, and air quality.

10.4.1 LAND

The construction and implementation of the recommended solid waste facilities, (recycling, composting, landfill with buffer zones and administration buildings) require long-term land commitments. However, landfill and excavation of cover material for the landfill would be phased out over a period of years. Thus, portions of a site could be available at some point in the future for other types of use. Therefore, the proposed action does not represent an irreversible commitment of the majority of a site.

10.4.2 WATER QUALITY AND USAGE

Certain quantities of water would be consumed during the construction of the structures associated with the proposed facilities. Water usage would be committed to making construction-related materials (primarily concrete), controlling fugitive dust (as necessary), and providing potable water. Overall, this commitment would be minimal and required for only a relatively short duration.

Additional quantities of water would be required for the operation of the proposed facilities. Water requirements for the operation of the recycling facility would be minimal. Landfilling, composting, and recycling operations may require minimal amounts of water for the control of fugitive dust emissions and for cleanup. Composting may require small quantities of water in the development of the compost product. Sanitary and potable water for personnel involved with these activities would also be required. For a waste-to-energy facility, water consumption will depend upon the design of the facility, if waste-to-energy is to be implemented at some point in the future. Consumption can be minimal if an extensive water recycling design is used. Ash residue disposal could require the use of water to control fugitive ash residue emissions.

10.4.3 ENERGY AND MATERIALS

Short-term energy expenditures would be required during construction of the solid waste facilities, including consumption of non-renewable resources such as gasoline and fuel oil. Resources would be committed to the physical construction of the structures and associated on-site roadways (such as sand, gravel, ferrous and non-ferrous metals, petrochemical based products, and concrete.) These materials are available in sufficient quantities such that their use for these purposes would not limit their overall availability. Depending on the site developed, and the layout on that site, it may be necessary to import soil to make the site meet NYSDEC requirements.

Fuel would be expended for the transport of solid waste and recyclables to the site, and for non-processible waste disposal. The amount of fuel required for transport of solid waste to the site may increase from the current transportation requirements, since all municipalities would now be traveling to a central location. Additionally, as currently envisioned, composting and recycling facilities may require additional consumption of fuel to operate machinery.

In the long-term, electrical energy would be produced rather than consumed if a waste-to-energy facility is implemented. Except for start-up of the facility, no additional fuel would be required for operation. This power would be obtained from Central Hudson Gas & Electric. Electrical power generated by the waste-to-energy facility would be used to operate the facility's lighting and processing equipment and net energy could be sold to an electric utility under the Public Utilities Regulatory Policy Act (PURPA).

10.4.4 AIR QUALITY

Air quality effects during the construction phase at a facility site are essentially limited to fugitive dust emissions. The preparation activities such as clearing, grading and blasting will generate dust which would ultimately become suspended in the atmosphere. Traffic moving in and out of the site would further increase the amount of dust. In general, construction would be restricted to a one to two year period and any effects would cease at the completion of construction. It should be noted that construction of the landfill would occur in phases and would continue throughout the life of the project.

Operation of the solid waste facilities would not irretrievably affect air quality. The excavation for landfill construction and cover material would have effects similar to those associated with site construction. These, too would be temporary, lasting only as long as the excavation activities occurred. Composting may generate some fugitive dust, although these effects could be controlled through operations procedures and would not represent an irretrievable effect on air quality.

Air quality would be affected by emissions from a waste-to-energy facility. Other elements of the proposed action would have little or no effect on air quality. Although a waste-to-energy facility would emit certain pollutants, air quality would not adversely affect (as defined by the Clean Air Act) the environment or people in the vicinity of the site.

10.5 USE AND CONSERVATION OF ENERGY

The primary objective of the proposed action is to identify an environmentally sound, reliable alternative to the disposal of unprocessed solid waste in the

existing 15 municipal landfills located in the County. The amount of energy utilized will be a function of the technologies selected. Compost/recycle in conjunction with landfill has been identified as the recommended technology approach for the proposed Ulster County solid waste management plan. Waste-to-energy is not recommended at this point but has been analyzed. No matter which technology is to be developed, efforts to conserve energy will be emphasized.

During construction, gasoline, diesel, fuel and electrical power would be consumed to operate construction equipment. When the recycling and composting facilities become operational, resources would be conserved. Recovered materials would be sold for re-use, thereby conserving parent materials and energy used for their production from raw materials.

Building design would reduce heating and cooling needs, by means of insulation and building layout. The use of non-fossil fuels may be considered. It may be possible to reclaim energy from gases generated by decomposition in the landfill. In the case of a waste-to-energy facility, solid waste would be the primary source of fuel and the generation of excess energy in the form of steam or electricity would actually produce a net gain of energy.

While the total number of vehicle miles travelled would be somewhat greater with one solid waste disposal site rather than the 15 landfills now utilized, this would be offset to some extent by the fact that waste leveling and compaction equipment currently required to operate 15 separate municipal landfills would be reduced to that required at one site. A more detailed analysis of energy needs and conservation methods would be provided in subsequent site and technology specific environmental impact studies, and would be based on the analysis of the selected technologies

10.6 GROWTH INDUCING ASPECTS

Typically, the development of a parcel of land for residential or commercial/industrial use would have growth inducing aspects associated with it. However, the proposed action is the development of a solid waste management plan. This action does not appear to have any significant growth inducing impacts associated with it. Solid waste disposal, a necessary service, would continue to be provided to the County through the implementation of this project.

The sizing of the solid waste management facilities takes into account the expanding population of the County. Therefore, solid waste disposal would not inhibit local residential, commercial, or industrial development within the County. Since the County's growth would not be limited by its ability to dispose of solid waste, the proposed action is neither viewed as an impetus nor a deterrent to growth.

The construction of the solid waste management facilities would increase the demand for labor on a short-term basis. As most of this manpower is expected to be available in the local community, positive economic growth would be experienced for a short range of time.

Upon completion of the facilities, additional permanent jobs will be created. It is likely that this labor, too, would be from the local area. In addition, maintenance and repair of equipment may periodically require specialized service. This may also benefit the local area.

10.7 REGULATORY REQUIREMENTS

The proposed action will comply with applicable environmental laws and regulations of all federal, state, county and local agencies having jurisdiction over the proposed action. The agencies that may be involved in the project review include the U.S. Army Corps of Engineers (USACOE), Federal Aviation Administration (FAA), United States Environmental Protection Agency (USEPA), New York State Department of Environmental Conservation (NYSDEC), New York State Department of Transportation (NYSDOT), and the County Board of Health. A list of the major permits, certifications, and reviews required for the implementation of the solid waste facilities is contained in Table 10-6 Each of the permits is discussed below.

10.7.1 FEDERAL [illegible]

U. S. Army Corps of Engineers - USACOE regulates any construction activity, structural work, dredge and fill operations, process discharges involving waterways and wetlands. The regulatory authorities and responsibilities of the USACOE are based on Section 10 of the River and Harbors Act of 1899 (33 U.S.C. [illegible]), Section 404 of

TABLE 10-6

SUMMARY OF RELEVANT REGULATORY REQUIREMENT FOR
LANDFILL, RECYCLING, COMPOSTING, AND WASTE-TO-ENERGY FACILITIES

Regulatory Program	Responsible Agency/Party	Comment
Federal		
Dredge and Fill Permit	USACOE	Would apply if dredging or filling in waters of the U.S.
Nationwide 7	USACOE	Applies if intake or discharge structure is built in waters of U.S.
Construction Notice	FAA	Would apply if stack height exceeds 200 feet or if within three miles of airport, or if obstruction standards in FAA Part 77, subpart C are exceeded.
New Source Performance	USEPA	Would apply for waste-to-energy facility in excess of 50 tpd.
NESHAP	USEPA	May apply for waste-to-energy facility.
PSD Regulations	USEPA	Would apply for waste-to-energy facility.
New Source Review	USEPA	Would apply if waste-to-energy facility was located in non-attainment area.
Ulster County Resource Recovery Agency		
SEQR Process	Ulster County Resource Recovery Agency	Would apply.
State		
Solid Waste Management Permit	NYSDEC	Would apply for all solid waste facilities except for the recycling facility less than 5 tpd.
Air Permits	NYSDEC	Would apply for waste-to-energy facility.
SPDES Permit	NYSDEC	Would apply if discharging waste water to surface waters.
Stream Protection Permit	NYSDEC	Would apply if construction is within bed or bank of stream; or for dredge and fill activities in surface water.

continued

TABLE 10-6 (con't)

SUMMARY OF RELEVANT REGULATORY REQUIREMENT FOR
LANDFILL, RECYCLING, COMPOSTING, AND WASTE-TO-ENERGY FACILITIES

Regulatory Program	Responsible Agency/Party	Comment
State (cont'd)		
Water Quality Certification	NYSDEC	Would apply if USACOE Dredge and Fill Permit is required.
Freshwater Wetlands Permit	NYSDEC	Would apply for fill or disturbance in New York State wetlands, plus 100 foot buffer.
Highway Access Permit	NYSDOT	Would apply.
Coastal Consistency Assessment	NYSDEC	Would apply if facility is to be constructed in the coastal zone.
County		
Septic System Permit	Ulster County DOH	Would apply if septic system is required.
Water Supply Approval	Ulster County DOH	Would apply if surface or ground water is diverted for use.
Local		
Building Permit	Building Inspector	Would apply only if private development.
Site Plan Approval (Water, Sewage)	Planning Board	Would apply only if private development.
Demolition Permit	Building Inspector	As applicable, only if private development.

the Clean Water Act (33 U.S.C. 1344), and Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended (33 U.S.C. 1413). A dredge and fill permit would apply if such activities take place in waters of the United States including, deposition of fill material in wetlands, swamps, bogs, and waterways. If a navigable river (e.g., Hudson River, Rondout Creek, Wallkill River) is used as a water source or discharge, then a Nationwide 7 permit would be required from the USACOE for the construction of an intake or discharge structure. Details of these requirements are provided in Title 33 Code of Federal Regulations, Parts 320 through 330.

Federal Aviation Administration Regulations - The FAA requires an approval for any proposed construction or alteration of a structure that may interfere with air travel or radio and radar communications. This would apply if a stack from a waste-to-energy facility were to be constructed. Based on information provided in the Part 77 Permit Application, the FAA would conduct an aeronautical study to determine whether the proposed stack or other structures would represent a hazard to air navigation. That study would consider flight paths of aircraft traveling in the vicinity of the site, as well as major airport flight routes.

Air Quality Regulations - All major new sources of air pollution are subject to a number of air quality regulations that seek to limit the impact of the source on ambient air quality. A waste-to-energy facility located in the County must satisfy the following federal regulations:

40 CFR50	-	National Ambient Air Quality Standards (NAAQS)
40 CFR60 (Subpart E)	-	Incinerator Performance Standards, New Source Performance Standards
40 CFR61	-	National Emission Standards for Hazardous Air Pollutants (NESHAP)
40 CFR52	-	Prevention of Significant Deterioration Review

If a waste-to-energy facility was ever to be implemented, air quality issues would be a major focus of regulatory proceedings.

10.7.2 STATE PERMITS/APPROVALS

Certain permits required by the Environmental Conservation Law must follow application requirements as delineated in 6 NYCRR Part 621 Uniform Procedures and hearing procedures contained in 6 NYCRR Part 624.

State Environmental Quality Review Act - In accordance with SEQRA, (Environmental Conservation Law Article 8 and 6 NYCRR Part 617), all actions that may have a significant effect on the environment must be preceded by preparation of an EIS to review potential effects associated with its implementation. This provides a means for agencies to give early consideration to environmental factors, as well as social and economic issues, by reviewing the conceptual framework of the proposed action. Additionally, it represents a means for project sponsors to systematically consider these aspects in project planning and design, and for project sponsors to identify the criteria that will be utilized in selecting a site and a technology.

Solid Waste Management Permit - In accordance with Environmental Conservation Law Article 27 and pursuant to 6 NYCRR Part 360, proposed landfill, composting, and waste-to-energy facilities to be construed and operated in New York State require a Part 360 permit to construct and a certificate to operate. Recycling facilities greater than 50 tpd also require a Part 360 permit. The submissions that accompany the construction permit application are extensive and include maps and plans, description of proposed plans of operation, analyses of financial data, economic conditions, marketability of recovered materials and energy, and construction plans and schedules.

In addition to the above requirements, the NYSDEC has the jurisdiction to regulate the prevention reduction of [illegible] air, noise, odors, and aesthetic conditions to ensure public health, safety, and welfare directly associated with solid waste management facilities. The proposed facilities would comply with these specifications.

The Part 360 permit review process also considers such factors as traffic and adjacent land use and requires demonstration that the facility is consistent with the State-approved solid waste management plans for the region. This demonstration must include justification of facility needs, description and control of inter-or intra-district waste flow agreements, and

discussion of overall facility implementation and management.

State Pollution Discharge Elimination System (SPDES) Permit - Environmental Conservation Law Article 17 and implementing regulations 6 NYCRR Part 750 provide the NYSDEC with authority to review and approve proposed new point source discharges of wastewater, including stormwater, process, and thermal discharges. Potential wastewater sources may include leachate from the landfill facility; and cooling water, boiler blowdown and sanitary water from the potential waste-to-energy facility. If these wastewaters are treated and discharged to surface to ground waters, this permit would be required. The effluent must be in compliance with Federal and State effluent standards, when applicable. In addition, a brief description of the principal types of processing done at the facility would be required, as well as the specific chemical constituents of the discharge, if any.

Coastal Consistency Assessment - The State Coastal Resources Act contains policies pertaining to the use and protection of natural and manmade coastal resources in order to achieve a balance between economic development and preservation. Actions undertaken by State agencies within the coastal area must be consistent with the applicable coastal policies. If applicable, and the site is within a designated coastal zone, the procedure for consistency assessment must be performed and the Coastal Assessment Form must be completed for submission to the New York Department of State.

Stream Protection Permit - This permit is required by NYSDEC if construction is within the bed or bank of a stream, or for dredge and fill activities in surface water.

Water Quality Certification - This certification is required by NYSDEC if the USCOE Dredge and Fill Permit is required.

Highway Access Permit - This permit is required by the New York State Department of Transportation for facilities that are developed along a state highway.

Air Pollution Control Regulations - Two air pollution control permits are required for construction of a waste-to-energy facility. They are the PSD permit, which includes non-attainment new source review, and the New York State air

permit. The PSD program is a federal program promulgated pursuant to the Clean Air Act, under which standards were developed to regulate the licensing of new or modified sources in attainment areas. Through the state implementation plan, the USEPA has delegated PSD review and permit issuing authority to the NYSDEC. These requirements are implemented by the State through Environmental Conservation Law Article 19 and regulations 6 NYCRR Part 219. The USEPA, however, still provides review and comment on the permitting process.

10.7.3 COUNTY PERMITS

A septic system permit would be required by the Ulster County Department of Health if a septic system is to be developed. This department also regulates diversion of surface or ground water for water supply use.

Any facility must be constructed in accordance with the New York State Uniform Building Construction Code. For publicly owned projects, responsibility for Code administration rests with the government carrying out the project.

10.7.4 LOCAL PERMITS

Applicable building, zoning, or construction requirements are under the jurisdiction of the municipality and must be satisfied if a private developer constructs and owns the facility. Examples include building permits and site plan approvals. Discharge of sanitary and/or process wastewaters, if any, to a municipal treatment facility would require approval of the district involved.

11.0 PUBLIC PARTICIPATION - SEQRA COMPLIANCE

11.0 PUBLIC PARTICIPATION

11.1 GENERAL

In developing the FGEIS, the Supplemental FGEIS, and the Findings Statement, the UCRRA and its project team have met with and received input from numerous groups interested and involved in the County's Solid Waste Management Plan. Many of the suggestions and comments received have been incorporated into the "Plan". Table 11-1 contains a list of some of the avenues through which the UCRRA has received public input. Five volumes of Public Hearing statements on the DGEIS and four volumes of Public Hearing statements on the S-DGEIS have been included in the SEQRA process record. All comments and views expressed during the "Plan's" development by concerned governmental, environmental, and commercial interests and the general public have been responded to and incorporated into a Response Document (One Volume) to the DGEIS and a Supplemental Response Document (One Volume) to the S-DGEIS. Minutes and tape recordings of eleven Board Workshops on development of the Findings Statement are also included in the record. In addition, the UCRRA continues to receive comments and suggestions from local municipal representatives, neighboring jurisdictions, Involved Agencies, and the public. A summary of the public's participation in the "Plan" development follows.

The SEQRA process itself provides a number of mechanisms for obtaining input from the public and others. These include the lead agency designation process, scoping meetings, formal public comment periods, public hearings, and special informational meetings which occurred once the DGEIS and Supplemental DGEIS had been determined to be complete by the UCRRA as a lead agency.

Another channel for input are the monthly meetings of the UCRRA Board which typically include an opportunity for public comment and, if appropriate, responses from the UCRRA Board, staff, or project consultants. The UCRRA has also established a Citizen Advisory Committee (CAC) to obtain input from a wide range of groups. Table 11-2 identifies the organizations that are represented on the CAC. The CAC has met on a monthly basis to discuss and/or review issues with UCRRA staff and project consultants to provide to the UCRRA through the Vice-Chairman of the UCRRA Board, who serves as Chairman of the CAC.

TABLE 11-1

AVENUES FOR PUBLIC PARTICIPATION

(1988 - 1990)

Type	Frequency
o SEQRA Scoping Sessions	3
o SEQRA Public Hearings	6
o Extended Public Comment	190 days
o Special Public Informational Meetings on Planning	9
o Citizen Advisory Committee Meetings	29
o Special Board (UCRRA) Workshops	15
o Regular and Special Board Business Meetings	38
o County and Local Government Public Informational Sessions	43
o Public Presentations With Private Sector Organizations	7

The UCRRA and its project team have met on a number of occasions with the Ulster County Legislature to review the status of the preparation and development of the draft GEIS/Solid Waste Management Plan.

Many meetings have been held with Ulster County Association of Town Supervisors and individual Town Boards/City Councils to discuss the development of the draft GEIS and specifically, the Recycling Action Plan.

Meetings have also been held periodically with the Region 3 office of the NYSDEC located in New Paltz to discuss key issues related to the draft GEIS and S-DGEIS and to confirm the direction of the solid waste management program in Ulster County. In addition, the UCRRA has extended a standing invitation for representatives of the

Region 3 office to attend the monthly UCRRA Board and CAC meetings.

With regard to the siting analyses found in the DGEIS and Supplemental DGEIS, draft siting criteria were reviewed with the CAC and, where appropriate, were revised to reflect their comments. Once the siting analyses reached the point of identifying candidate areas for further consideration, a series of public information meetings and public hearings were held.

TABLE 11-2

UCRRA CITIZEN'S ADVISORY COMMITTEE

League of Women Voters of Mid-Ulster County	Ulster County Development Corporation
Catskill Center for Conservation and Development	Ulster County Planning Board
Hudson Valley Regional Council	City of Kingston Common Council
Sierra Club	Ulster County Sanitation Corporation
Ulster County Association of Town Supervisors	Ulster County Board of Health
Ulster County Environmental Management Council	Hudson Valley Green
Ulster County Chamber of Commerce	Work on Waste - Ulster County Chapter
Ulster County Cornell Cooperative Extension	

In addition to the above activities, the UCRRA and its project consultants have communicated with neighboring counties regarding the status of their solid waste management programs to obtain insights on their experiences. The UCRRA staff also held numerous conversations and received or exchanged correspondence with interested groups and individuals in Ulster and neighboring counties. For a description of the measures used to secure neighboring jurisdiction's participation in the Plan, the effects of including neighboring jurisdictions in the plan, and any limitations the plan's implementation would impose on the neighboring jurisdiction's solid waste management program, the reader is referred to DGEIS, Volume I, Section 3.4. and Section 11.4 of this document.

Following is a listing of meetings, Public Hearings, information sessions, etc., that have been held by UCRRA all of which constitute avenues for public participation in developing Ulster County's Solid Waste Management Plan:

11.2 SEQRA RELATED MEETINGS, HEARINGS, PUBLIC COMMENT PERIOD

SEQRA Scoping Sessions

5/10/88 1:00 PM Ulster County Community College, Town of Marbletown

5/10/88 7:00 PM Ulster County Community College, Town of Marbletown

5/11/88 7:00 PM Central Hudson Building, City of Kingston

SEQRA Public Comment Periods

7/17/89 - 9/18/89 Extended Public Comment period on DGEIS/Plan

4/09/90 - 5/23/90 Extended Public Comment period on Supplemental DGEIS

6/21/90 - 9/20/90 Extended Public Review period on Final GEIS and Supplemental Final GEIS

SEQRA Public Hearings

8/16/89 7:00 PM Miller Jr. High School, Town of Ulster

8/17/89 7:00 PM Saugerties High School, Town of Saugerties (on DGEIS)

9/07/89 4:00 PM Ulster County Community College, Town of Marbletown (on DGEIS)

9/07/89 7:00 PM Ulster County Community College, Town of Marbletown (on DGEIS)

5/01/90 3:00 PM Ulster County Office Building, City of Kingston

5/01/90 7:00 PM Miller Jr. High School, Town of Ulster

SEQRA Public Informational Meetings

9/20/88 Town of Ulster, Siting Analysis- Overview

9/21/88 Town of Plattekill, Siting Analysis- Overview

10/06/88 Town of Saugerties, Siting Analysis- Overview

1/18/90 Town of Gardiner, Supplemental Siting Analysis- Overview

3/08/90 County Office Building, City of Kingston on Supplemental DGEIS and Siting Analysis

7/06/90 Miller Jr. High School, Town of Ulster on DGEIS, SEQRA Process, and Plan

7/12/90 Ulster County Office Building, City of Kingston on DGEIS, SEQRA Process, and Plan

8/03/90 Plattekill Fire House, Town of Plattekill on DGEIS, SEQRA Process, and Plan

8/08/90 Saugerties High School, Town of Saugerties on DGEIS, SEQRA Process, and Plan.

11.3 OTHER PUBLIC PARTICIPATION ACTIVITIES

Citizen's Advisory Committee Meetings

2/18/88 Organizational Meeting
3/17/88 Malcolm Pirnie [illegible]on RE: Scoping Meetings, Recycling, Recycling Development Projects, Public Information
4/21/88 Malcolm Pirnie, Scoping Meetings, Recycling
5/19/88 Malcolm Pirnie, Siting Criteria
7/21/88 Recycling Action Plan distributed to CAC members
8/19/88 Recycling Action Plan Discussion
9/15/88 Malcolm Pirnie (Bob Bolton) Ulster County Legislature Presentation of 9/08/88
10/20/88 Malcolm Pirnie (Bob Bolton) Presentation on Siting Criteria
11/17/88 Siting process (Bob Bolton), Recycling, Grant Applications for Recycling
12/15/88 Malcolm Pirnie (Bob Bolton) Report on Recycling Markets
1/19/89 Malcolm Pirnie (Bob Bolton) Ulster County Legislature Presentation 12/29/88
2/22/89 Malcolm Pirnie (G. Gale) Recycling Projects
4/06/89 Plastics Discussion (Legislation, Recycling)
5/04/89 Consensus Building (Charlie Shaw)
6/08/89 Host Community Program

7/06/89 Response to DGEIS Begun
8/14/89 Host Community Program
8/15/89 Host Community Program
9/14/89 Host Community Program and DGEIS Responses
10/05/89 DGEIS & S-DGEIS (New Studies) Public Hearing Results; Host Community Program
11/02/89 Recycling Action Plan
12/07/89 S-DGEIS (New Studies) & Host Community Program
2/14/90 Recycling Action Plan and S-DGEIS Results
5/09/90 Reorganizational; Household Hazardous Waste Program; Findings Statement Review
6/04/90 Reorganizational; Findings Statement
7/27/90 Findings Statement Review
8/07/90 Findings Statement Review
8/28/90 Special Meeting with UCRRA Board Findings Statement Review
9/06/90 Findings Statement Review

Municipal Recycling Coordinator's (MRCs) Roundtable

Since July 19, 1988, thirty Municipal Recycling Coordinator's Roundtable discussions have been convened by UCRRA. The primary purpose of these discussions are to accept input from the County's coordinators who represent each of the County's 24 municipalities on the development of the Recycling Action Plan. Likewise, how the Recycling Action Plan interfaces with municipal recycling planning efforts is considered.

Special Board (UCRRA) Workshops

6/21/89 On DGEIS Completeness

9/26/89 On SEQRA Process and DGEIS

3/08/90 On Supplemental DGEIS completeness

3/15/90 On Supplemental DGEIS completeness

4/05/90 Workshop #1 on Recycling Action Plan Findings

5/03/90 Workshop #2 on Recycling and Household Hazardous Waste Findings

5/15/90 Workshop #3 on Solid Waste Disposal Technology Alternative Findings

5/24/90 Workshop #4 on Plan Implementation Strategies and Environmental Impacts Findings

6/07/90 Workshop #5 on Host Community Program and Waste Characterization Findings

6/11/90 Workshop #6 on Landfill Reclamation, Use of Existing Landfills, Single vs. Multiple Landfill and Site Specific Landfill Siting - Findings

6/12/90 Workshop #7 on Supplemental Siting Analysis, Transportation Cost Analysis, Hydrogeological Testing and Soil Stability Testing and Landfill Siting Findings

7/31/90 Workshop #8 on Refinement of Findings Statement Sections 1.0 Adopting the S.W.M.P., 2.0 Recycling Action Plan, and 3.0 Adopting Landfill Technology as primary disposal strategy

8/16/90 Workshop #9 on Refinement of Findings Statement Sections 3.0 Adopting Landfill Technology as primary disposal strategy, and 4.0 Landfill Siting, and further testing

8/28/90 Workshop #10 on further Refinement of Findings Statement Sections 5.0 Host Community Program, 6.0 Implementation Methods for Future Actions, and 7.0 Conclusions

9/20/90 Workshop #11 on all sections of Findings Statement and Solid Waste Management Plan

Regular and Special Board Business Meetings

Since May 1988 thirty-eight regular and special Board Business Meetings were held. In each meeting there was an opportunity for the public to comment on any aspect of the Agency's work including; solid waste management planning, facility siting, recycling program implementation, etc. All comments were received by the Agency Members and entered into the meeting minutes.

County and Local Government Public Information Sessions

County Legislature Meetings

8/14/88 DGEIS Project Status Report
9/08/88 Preliminary Siting Analysis (Overview)
11/10/88 DGEIS Project Status Report and Siting Analysis discussion
12/29/88 Technology Evaluation (Overview)
4/13/89 DGEIS Project Status Report
7/13/89 DGEIS Project Status Report
8/22/89 DGEIS Project Status Report and UCRRA Budget with Ways & Means Committee
10/22/89 Recycling Action Plan - Status Report
12/20/89 Supplemental DGEIS Status Report with Ways & Means Committee

1/31/90	Supplemental DGEIS Status Report and UCRRA Budget with Ways & Means Committee
2/08/90	FGEIS/Plan Status Report and UCRRA Budget
4/30/90	FGEIS/Plan Status Report with Ways & Means Committee
10/11/90	Presentation FGEIS, Findings Statement and Waste Management Plan to County Legislature

Local Government Meetings

9/25/89	UC Supervisors' Association - Presentation DGEIS and Draft Plan
9/27/89	UC EMC - Presentation DGEIS and Draft Plan
10/24/89	Town of New Paltz - Recycling Action Plan
11/29/89	UC EMC - Presentation SDGEIS - Use of Existing Landfills
1/03/90	UC Planning Board - Presentation on Use of Existing Landfills and SDGEIS
1/08/90	Town of Marlborough - RAP and Intermunicipal Agreement
1/22/90	UC Supervisors' Association - Presentation SDGEIS and Use of Existing Landfills
2/21/90	Town of Plattekill - RAP and IMA
2/22/90	UC Supervisors' Association - Presentation RAP and IMA
3/02/90	Town of Woodstock - Presentation RAP
3/05/90	Town of Olive - RAP and IMA
3/13/90	City of Kingston - RAP and IMA
3/14/90	Town of Marbletown - RAP and IMA
3/19/90	Town of Saugerties - RAP and IMA
3/27/90	Town of Denning - RAP and IMA
4/11/90	Town of Shandaken - RAP and IMA
4/26/90	Town of Shawangunk - RAP and IMA
5/02/90	Town of Rosendale - RAP and IMA
5/07/90	Town of Rochester - RAP and IMA
5/09/90	Town of Wawarsing - RAP and IMA
5/17/90	Town of Olive - RAP and IMA
5/22/90	City of Kingston - RAP and IMA
5/29/90	Town of Woodstock - RAP and IMA
6/08/90	Town of Marbletown - RAP and IMA
6/19/90	Town of Hurley - RAP and IMA
6/27/90	Town of Esopus - RAP and IMA
6/27/90	Town of Kingston - RAP and IMA
8/02/90	Town of Hardenburgh - RAP and IMA
8/06/90	UC Supervisors' Association - RAP and IMA
8/29/90	Towns of Shandaken, Kingston, Denning, and Hardenburgh - RAP and IMA

Presentations to Private Organizations

9/21/89	UC Bar Association - Presentation on Draft Plan
9/26/89	League of Women Voters - Presentation on Draft Plan and DGEIS
11/14/89	UC Chamber of Commerce - Presentation on Draft Plan

2/06/90 City of Kingston Lions Club - Presentation on Draft Plan
3/14/90 Hurley Lions Club - Presentation on Draft Plan
5/31/90 New Paltz Rotary - Presentation on Recycling Action Plan
8/02/90 City of Kingston Kiwanis Club - Presentation on Draft Plan

11.4 NEIGHBORING JURISDICTIONS

Ulster County Resource Recovery Agency contacted the counterparts of the Agency, or the Chief Executive Officers of the surrounding counties to determine the status of solid waste management planning in those counties and to determine if regional cooperation would be appropriate. The following is a synopsis of the discussions with the neighboring jurisdictions:

- **Dutchess County Resource Recovery Agency** - The Dutchess County Resource Recovery Agency has embarked on a resource recovery program utilizing mass-burn technology. That Agency is presently in the process of siting a landfill to be sized for the needs of Dutchess County. Information from the County indicated that constraints on suitable landfill acreage in the County were severe and the Resource Recovery Facility was not sized sufficiently to receive any waste from outside the jurisdiction.

- **Orange County** - Orange County was involved in litigation concerning the continued use of its existing facility at the time of inquiry. Its present plans include developing an expansion of that landfill and then studying solid waste management alternatives in the future. The County's intention is to act as its own "region".

- **Greene County** - The Greene County Legislature has recently determined to develop no facility within its borders for the disposal of solid waste, but rather to export such waste to other jurisdictions utilizing long-haul technology.

- **Columbia County** - Columbia County had originally reviewed the utilization of waste energy technology and landfilling in conjunction with Greene County. The County is presently exporting solid waste to Rensselaer County. The County is not planning at this time to construct any solid waste management facilities within its boundaries.

- **Sullivan County** - Sullivan County advised that it was expanding an existing landfill facility to serve as a Countywide solution. It was not interested in providing or sharing facilities with adjoining counties.

- **Delaware County** - Bordering Ulster County on the west, access to Delaware County from the significant population areas of Ulster County preclude any serious consideration of intercounty cooperation.

The Ulster County plan is a regional plan to the extent that it seeks to serve all jurisdictions within the established region, namely the County of Ulster. The Ulster County Resource Recovery Agency is presently cooperating with adjoining counties in the development of regional packaging legislation and development of a regional sewage sludge project through the Hudson Valley Regional Planning Council. No program that is to be developed as part of the Solid Waste Management Plan will have an adverse impact on or restricting program in any adjoining jurisdiction. For a further discussion of activities related to the assessment of neighboring jurisdictions solid waste management programs, the reader is referred to the DGEIS, Volume 1, Section 3.4. Table 11-3 presents a summary of neighboring jurisdictions' regional waste disposal planning efforts as of 1988.

TABLE 11-3

REGIONAL WASTE DISPOSAL PLANNING
(As of 1988)

County	Waste Generation (tpd)	Current Method of Disposal	Planning Efforts
Columbia	150 (1)	Export to City of Troy Landfill for Six Months	GEIS for Landfill Development
Delaware	100 (2)	Delaware County Landfill 2 Local Landfills	Landfill Expansion Plan for Delaware County Landfill (3 - 5 year total)
Dutchess	650 (2)	Waste-to-Energy Facility	GEIS for Waste/Ash Handling and Recycling Plan Development
Greene	100 (2)	Town of Catskill Landfill Hunterton Landfill	Draft GEIS for Solid Waste Management Plan
Orange	800 (2)	Orange County Landfill Al Turi Landfill Town of Greenville Landfill	Landfill Expansion Plan for Orange County Landfill (5.2 years total)
Putnam	200 (2)	Export to Al Turi Landfill in Orange County 2 Local Landfills	GEIS for Solid Waste Management Plan
Sullivan	175 (2)	Monticello Landfill	20 Year Landfill Life Remains

NOTE: (1) Columbia County DGEIS, Barton and Loguidice, 1988
(2) NYSDEC Solid Waste Management Plan, 1987

12.0 REFERENCES

12.0 REFERENCES

12.1 List of References - Primary Source Documents

Following is a list of all Primary Source Documents related to the Ulster County Resource Recovery Agency's 1990 Final Generic Environmental Impact Statement and used in the preparation of this document:

a) Draft-Generic Environmental Impact Statement (DGEIS, Volumes I, II, III, IV), June 1989
b) Recycling Action Plan (RAP) (Volume IV of the DGEIS), June 1989
c) Public Comment Record on DGEIS; August-September 1990 (Four hearings and one volume of written statements)
d) Final DGEIS and Response Document to the DGEIS (One volume), June 1990
e) Supplemental-Draft Generic Environmental Impact Statement (S-DGEIS), April 1990
f) Public Comment Record on the S-DGEIS, May 1990 (Two Hearings and two volumes of written statements)
g) The Final S-DGEIS and Supplemental Response Document to the S-DGEIS (One volume), June 1990
h) Findings Statement (One volume), September 1990
i) Executive Summary (One volume), September 1990
j) Additional Findings, February 1991

All primary source documents are on file at the offices of the Ulster County Resource Recovery Agency, 52 Main Street, Kingston, New York 12401. They are also on file at local government offices and libraries throughout Ulster County, and the offices of the New York State Department of Environmental Conservation, Region III, South Putt Corners Road, New Paltz, NY.

12.2 List of References - Secondary Source Documents

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12.3 RECYCLING EDUCATION WORK PLAN

This Recycling Education Plan has been developed to coincide with the component actions of the Ulster County Solid Waste Management Plan described in Chapter 9. It includes education in other areas of Solid Waste Management, particularly as they relate to waste reduction and recycling. The Recycling Education Plan will be reevaluated periodically (at least annually) and updated to address current program needs. Recycling rates (separation and processing efficiencies and participation rates) and compliance by residents, businesses, and hauler with the Mandatory Source Separation and Recycling Law will be evaluated on an ongoing basis to target area in which improved education could further maximize waste reduction and recycling.

I. Waste Reduction

A. Participate in Hudson Valley Regional Packaging Task Force to develop regional approach to waste reduction through education and legislation (September, 1989 and ongoing).
B. Review Federal and State waste reduction initiatives and legislation; maintain file on this (ongoing).
C. Recommend local initiatives (Fall, 1991 and ongoing).

D. Residential Consumer Education (refer to p. 9-12):
1. "Waste Reduction Through Consumer Education Campaign" --have applied for NYSERDA grant (Fall, 1991).
   a. Create displays and brochures, establish media campaign, hold Shoppers' Tours and "Master Shoppers" programs, and develop school waste reduction programs in cooperation with Cornell Cooperative Extension and other community groups (1989--1992 and ongoing).
   b. Major Waste Reduction Campaign (Summer, 1992 - Spring, 1993)
   c. Annual Holiday Season Waste Reduction Campaigns

E. Commercial Waste Reduction (refer to p. 9-13):
1. Prepare "Guide to Commercial/Institutional Waste Reduction and Recycling" (Fall, 1991).
2. Maintain a file on Commercial, Institutional and Industrial Waste Reduction; establish local commercial/ industrial waste exchange; monitor State and Regional waste exchanges: IMRA and NIWA (1990 and ongoing).
3. Train MRCs to assist with Waste Audits and provide technical assistance to C/I sector on waste reduction.
4. Waste Reduction and Recycling Plans to be prepared and submitted by all commercial businesses and institutions by September 1, 1992, for existing businesses and ongoing for newly established businesses.
5. With MRCs, evaluate C/I Waste Reduction and Recycling Plans, make follow-up recommendations and reevaluate for effectiveness (September, 1992 through 1993 and ongoing).

II. Household Hazardous Waste

A. HHW Pilot Collection Day; June 9, 1990
1. Help plan and implement Household Hazardous Waste Pilot program sponsored by Ulster County EMC. Review pilot effort and make recommendations to Agency Board and HHW Team. Develop file on HHW programs and educational materials (1990 and ongoing).

B. UCRRA HHW Management Program

1. Develop preliminary HHW educational materials (display and brochures) in 1990-91. Public education will intensify as comprehensive HHW program is developed and direction given (1991-94). Household consumer education program will:
   a. Help public to identify HHW materials;
   b. Stress decreased use of hazardous materials by substituting less toxic alternatives;
   c. Recommend reuse of safely stored, clearly labelled products;
   d. Teach safe household storage and proper disposal at permitted HHW storage facility(ies), as developed by Agency through recommendations of HHW Team.
2. Train operators of solid waste management facilities in Household Hazardous Waste management, in

cooperation with NYS DEC (1992-94).

3. Develop HHW educational campaign stressing product identification, with possible shelf labelling to be implemented in retail stores which sell HHW products (1992-94 and ongoing).
4. Utilize local realtors to promote proper management of HHW, as well as waste reduction, recycling and composting information and public outreach (1992-94 and ongoing).

III. Recycling Education

A. Program Development - Phase I and II (Technical Assistance and Recycling Development Projects); 1989-90.

1. Provide technical assistance to municipalities with regard to local program development, markets, collection systems and other issues. Provide technical assistance to public on how to recycle; assist businesses to start commercial/institutional recycling programs.
2. Promote Recycling Development Projects through displays, brochures and other educational materials (banner, buttons, balloons and bumper stickers) at Ulster Co. Fair, Lion's Expo and other community events. Media campaign, including PSAs, billboards ("Jump Right In") and talk show interviews.

B. SAC System/MRDS - Intermunicipal Agreements for Collection, Processing and Marketing of Major Recyclable Materials

1. Local Government: Municipal officials and Solid Waste/Recycling staff and volunteers. Continue to provide technical assistance regarding SAC System, MRDS site development, local program development, marketing, data collection and reporting, quality control through training sessions (UCRRA Municipal Recycling Training Workshop and Manual, March 7, 1990), Town Board meetings, MRC Roundtable Meeting and summaries, guest speakers, memos.

   1991: Distribution of Household Recycling Containers, with educational materials developed by cooperative effort of Agency and municipalities.

   1992: Training session(s) for staff of Landfill/Recycling Centers stressing on-site education, the importance of monitoring, data collection, clear signage, and related issues. Develop manual and audio-visual materials to train new staff and reinforce information presented at training session(s). Update as needed.

2. Residents - Continue recycling education through displays and educational materials at public events, media releases, etc. (1990-92 and ongoing).

   1990: Develop and distribute education materials, including a preliminary set of standardized recycling instructions; also sets of recycling labels for 10 different materials, slide shows, expand library of videos and other educational resources.

   1991: Household Recycling Container Educational Kits with standardized UCRRA Recycling Instructions, "Recycling Pays Off" Sweepstakes Survey, HHW and Composting brochures, and updated List of Municipal Recycling Centers.

   1992: Evaluate residential Waste Reduction and Recycling ("Recycling Pays Off") sweepstakes/survey. Assess participation rates by material and by municipality. Develop systems and educational campaigns targeted to improve separation efficiencies and participation. Poster/bumper sticker public relations campaign; other education materials, as needed. "Master Recycler/Composter/ HHW Program," with Cornell Cooperative Extension.

3. Businesses and Multi-Family Dwellings (see Commercial/ Industrial/Institutional Recycling listed below)

4. Haulers:
   a. Meet with haulers to assure their input into Agency recycling policies, Mandatory Source Separation and Recycling Law and Rules and Regulations, and other related issues (1989-92 and ongoing).

b. Develop point-of-collection educational tool (sticker, doorknob hanger, checklist) for haulers to use to help curbside customers comply with mandatory legislation. Utilize haulers contacts to promote waste reduction, sound HHW management and other issues (1992 and ongoing).

5. Schools: Develop a program to introduce Waste Reduction and Recycling Education into existing curriculum (1989-1994 and ongoing).

a. UCRRA Waste Reduction and Recycling Education Performing Arts Program (1990-92) using performers to introduce students to sound solid waste practices.
b. Establish library of resources for educators (1990 and ongoing).
c. Research NYS pilot curriculum on waste reduction and recycling (Grade 7, Science and Technology in Society) in 1990. Develop Agency curriculum guides or purchase and circulate existing educational material, as suitable (ie. Revise, Recycle and Recover: Realizing Our Resources, by Claudia Swain, Frost Valley YMCA, 1991), 1990-92 and ongoing.
d. Establish Waste Reduction/Recycling Programs to be introduced into schools by Municipal Recycling Coordinators, including curriculum guide and audiovisual materials.
e. Provide teacher training in Solid Waste education through local colleges, including Teachers Center at SUNY/New Paltz and Ulster Co. BOCES (1993 and ongoing).
f. Expand waste reduction/recycling education to special presentations and hands-on workshops at local summer camps. Include field trips to recycling centers.

C. Miscellaneous Recyclables - provide technical assistance for collection and marketing of additional recyclable materials through updated market survey. With Recycling Oversight Committee and MRCs make recommendations for materials to be piloted, researched and, if economic markets are found to exist, added to the list of Regulated Recyclable Materials.

D. Mandatory Source Separation and Recycling Legislation

1. Develop and maintain file of mandatory recycling legislation, packaging initiatives, flow control, and other solid waste legislation, as well as SEQRA information and Municipal Law.
2. Participate in panels and discussions on Mandatory Recycling (Woodstock seminar, "Towards Mandatory Recycling," March 2, 1990; UCRRA Mandatory Source Separation/Recycling Legislation Workshop, April 29, 1991.)
3. Assist with drafting Ulster County's Mandatory Source Separation and Recycling Legislation and Additional Environmental Assessment Form. Develop educational campaign to assure that public understands the law and participates in recycling (June, 1991-March, 1992 and ongoing).
4. Provide ongoing technical assistance to municipalities, if they choose to develop local recycling and solid waste legislation.

E. Waste Tracking System - assist with development of tracking system and train MRCs, haulers, businesses and others to provide data, as needed (1990 and ongoing).

F. Commercial/Industrial/Institution Recycling - meet with CEOs and C/I recycling contacts to assure participation. Encourage in-house recycling education and in-services to especially include and custodial personnel. See Chapter 9, p. 9-31, 9-32.

1. Surveys of existing Commercial/Institution efforts (1990-91 and ongoing).
2. Prepare "Guide to Commercial Waste Reduction and Recycling" and "Guide to Waste Reduction and Recycling in Multi-Family Dwellings (MFD)," with sample Waste Reduction and Recycling Plans and reporting forms (1991-92).
3. Develop C/I tracking system (1990-92 and ongoing).
4. Hold C/I and MFD seminars cosponsored by Chambers of Commerce and other business organizations (Fall '91 and Spring '92).
5. Train MRCs to provide technical assistance to C/I and MFD sector, including review of Plans and reports (1991-92).
6. Expand Ulster County Office Paper Pilot Recycling Program, initiated November, 1990, to all County facilities by March, 1992, including in-service of office and custodial staff; expand to C/I sector by September, 1992.

G. Purchasing and Procurement of Recycled Products ("Buy Recycled" Campaign)

1. Develop vendors list for recycled products (1989-92 and ongoing).
2. Identify local printers and office suppliers stocking recycled paper; also list of contractors utilizing recycled building products, etc.
3. Work with Ulster County Purchasing Department and purchasing agents for local businesses and institutions to promote the use of recycled products.

IV. **C & D:** Educate contractors as to the benefits of separating C & D for reuse and recycling, both in cost-effectiveness and environmental preservation (1991-94 and ongoing, if needed).

V. Municipal Organic Waste Composting and Diversion:

A. Encourage Backyard Composting - prevent compostable organic material from ever entering the waste stream. Institute Backyard Composting Educational Program with Cornell Cooperative Extension, including both yard waste and food waste (Ch. 9; p. 9-38), 1989-94 and ongoing.

B. Municipal Yard Waste Composting - continue to promote proper separation, on-site processing of yard waste (1989-94 and ongoing). UCRRA Yard Waste Handling Seminar and Training Manual, October 3, 1989.

C. Food Waste Diversion - investigate use of food wastes as animal feed supplement and by renderers; educate suppliers appropriately (1989-92 and ongoing).

D. Apple/Grape Pomace & Offal Reuse or Composting - educate farmers and growers; restaurant and food service providers. Possible pilot to assess feasibility of separate household collection of organic wastes (1993-95 and ongoing).

E. Sewage Sludge Management Program - educate industries that may be depositing industrial waste products into sewage systems, as to the importance of high quality sludge for composting (1990-92).

F. Municipal Organic Waste Composting - develop file of information on MOWC. Educate public as to the importance of composting in Ulster County's Solid Waste Management Plan and their role in assuring a high quality end-product (1991-94 and ongoing).

G. MSW Processing - educational program to be developed after technology (ies) are assessed.

VI. **Medical Waste Management:** Waste Reduction and Recycling are important components. Assess CI WR/RC Plans by hospitals and other medical care facilities, provide technical assistance and advice (ongoing).

VII. Landfill:

A. Closure of existing facilities - help public to understand importance of proper landfill closure and ongoing monitoring of test wells to protect groundwater.
(1989 - 1992).

B. Landfill Facilities and Transfer Stations - As local landfills close and become transfer stations, develop an education campaign to help public to understand use of transfer stations for residual (non-recyclable, non-compostable waste). As the new landfill facility is sited and construction is being permitted, educate public with regard to state-of-the art landfill technology, stressing the importance of waste reduction, recycling and proper disposal of HHW in prolonging life of landfill and reducing leachate treatment costs (1991-97 and ongoing).

VIII. Host Community Program

A. Help develop questionnaires to assess host communities' priorities ("to define issues of relevance and concern to host communities.") [Ch. 9, p. 9-57]

VIII. Plan Amendment: Should amendments to the Plan be proposed, help to educate public as to relevant issues and rationales.

IX: Long-Range:

A. Public Recycling - recycling in public place should be phase in over time. Experience gained from pilot public recycling efforts at the Ulster County Fair (1989-91 and ongoing) and at other public events should prove beneficial in developing public recycling in general. As recycling becomes integrated into our lifestyle this task should become easier. Evaluate programs in State Parks, in cooperation with NYS DEC, and expand to all public facilities.

B. Review and evaluate effectiveness of waste reduction and recycling educational efforts; revise as needed to maximize participation and reduce residuals that must be landfilled.

C. Update market survey on ongoing basis; explore new market opportunities and alternative uses for materials (such as using shredded paper for animal bedding).

D. Work with Ulster County Economic Development Corp. and Ulster County Legislature's Economic Development and Promotion Committee, Hudson Valley Regional Council and NYS DED to promote and develop secondary materials processing businesses and industries (markets) in Ulster County and region, especially for difficult materials, such as tires.

E. Develop educational programs to improve solid waste employment opportunities such as continuing education courses at Ulster County for recycling coordinators, recycling/landfill staff and special training through BOCES/VO-TEC to prepare students for jobs in solid waste and recycling industries.

12.4 ULSTER COUNTY RESOURCE RECOVERY AGENCY MARKET LIST

(This list is partial, includes brokers, processors and end-markets; it will be updated periodically.)

ALUMINIUM:

Alcoa/Raritan Center 100 Clover Place Edison, NJ 08837	Ms. Beth A. Lanning Aluminum cans only (201) 225-9550
All-Container Recovery Inc. 28 Howard St. Piscataway, NJ 08854	Mr. Thomas Mele Alum. cans and scrap (201) 752-8823
J. Bass and Sons 9-11 Carleton Ave. Mt. Vernon, NY 10550	Mr. Michael Bass Alum. cans, with glass (914) 667-1443
Ellenville Scrap Metal 34 Cape Rd. Ellenville, NY 12428	Mr. Al Koplick Scrap metal and cans (914) 647-5460
Fox Run Recycling, Inc. P.O. Box 256 North Branch, N.Y. 12766	Mr. Craig Reimer Multi-material broker (914) 482-4400
Hudson Baler Corp. 220 Dupont Ave. P.O. Box 947 Newburgh, N.Y. 12550	Mr. Timothy Flanagan (914) 561-0167
J.C. Paper 57 Fulton Street Poughkeepsie, N.Y. 12601	Mr. Ron Chugerman (914) 454-2170
Karta Container & Recycling 1011 Lower South Street Peekskill, N.Y. 10566	Mr. Ken Cartelemi (914) 737-9211
Metals Unlimited Morrisonville, NY 12962	Mr. Randy Fink Alum. cans, foil, scrap (518) 563-1628
Metropolitan Mining Co., Inc. 58-30 57th St. Maspeth, NY 11378	Mr. Ken Flood (718) 894-5025 Alum.-cans
B. Millens and Sons 290 E. Strand Kingston, N.Y. 12401	Mr. Barney Millens (914) 331-7600
Pace Glass, Inc. 73-75 Cornelison Ave. Jersey City, N.J. 07304	Mr. Vincent Pace Alum. cans, with glass (201) 432-7983

Reynolds Aluminum Recycling
117 Murphy Road
Hartford, CT 06114

Mr. Curtis Betters
Cans, foil and scrap
(203) 278-6136
(800) 228-2525

Rochester Aluminum Smelting Corp.
26 Sherer St.
Rochester, N.Y. 14611

Ms. Linda Bald Florence
Alum. smelter: all grades
(716) 328-4740

RRT Empire Returns Corp.
101 Kuhn Rd. P.O. Box 536
Syracuse, N.Y. 13211-0536

Mr. Roger Guttentag
Mr. David Weitzman
Alum. cans
(315) 455-7080

Aluminum Industry: Aluminum Association
900 19th St., NW
Washington, D.C. 20006

GLASS:

ABCA Glass 40 Meshirter Rd. Kearney, N.J. 07032	Ms. Beverly Delisa (201) 997-5600
Anchor Glass McCannus Blvd. PO Box 849 Elmira, NY 14903	Mr. Joe Boedicker (607) 737-3531
Anchor Glass RT 101 Dayville, CT 06420	Mr. Dale Johnson (203) 774-9636
J. Bass and Sons 9-11 Carleton Ave. Mt. Vernon, NY 10550	Mr. Michael Bass (914) 667-1443 (sep'd or mixed color)
Bassichis Co. 2323 West Third St. Cleveland, Ohio 44113	Mr. Roger Hecht (216) 621-4181
Brockway, Inc. P.O. Box 550 Street Route 33 Freehold, N.J. 07728	Mr. Rodger Wangrien Manager, Purchasing Center and Scheduling (201) 462-6500
Eveready Beverage Dist. P.O. Box 307 Saugerties, N.Y. 12477 (July '91: Metro Mining)	Mr. Ernie Fick (914) 246-9803 246-2955
Hudson Baler (Baylor) Corp. 220 Dupont Ave. P.O. Box 947 Newburgh, N.Y. 12550	Mr. Timothy Flanagan (914) 561-0167
Karta Container & Recycling 1011 Lower South Street Peekskill, N.Y. 10566	Mr. Ken Cartelemi (914) 737-9211
Metropolitan Mining Co., Inc. 58-30 57th St. Maspeth, NY 11378	Mr. Ken Flood (718) 894-5025 or Jerry Coons (914) 246-5349
Owens-Brockway Glass 105 Tern Court Wilmington, Delaware 19808	Mr. Austin Fiore (419) 247-5000
Owens-Illinois, Inc. Great Bear Road RD #5 Fulton, NY 13069	Mr. Brian Houger (315) 598-0900
Pace Glass Co. 73-75 Cornelison Ave. Jersey City, NJ 07728	Vincent Pace/ Ginny Collorec (201) 432-7983 (includes window pane)
Recycling Enterprises Inc. P.O. Box 269 Oxford, Ma 01540	Mr. Murray Fox attn: Bea (508) 949-2797

REI Distributors, Inc.
510 Old Bridge Turnpike
P.O. Box 353
South River, N.J. 08882

(201) 238-7600
Mr. Murray Fox
Mr. Simon Sinnreich

Recycle Recovery
Rt. 208
Montgomery, NY

(914) 457-9696
Mr. Dan Sustak

RRT Empire Returns Corp.
101 Kuhn Rd., P.O. Box 536
Syracuse, NY 13211-0536

Mr. David Weitzman
(315) 455-7080
(800) 541-4948

Glass Industry:
Glass Packaging Institute
1801 K St. NW Suite 1105-L
Washington, D.C. 20006

PAPER:

American Independent Paper 15 South Depot Plaza Tarrytown, N.Y. 10591	Mr. Louis Quintano/ Matt Dennehy--High grades, News, OCC (914) 631-8285
Chesterfield Paper 2 Forest Ave. Paramus, NJ 07652	Mr. Rich Renert Mainly high grades, OCC (201) 843-1234
Columbia Corporation North Hoosick, NY 12133 (Boxboard manufacturer)	Mr. Larry Beayon Chipboard, OCC, ONP, mags., household mail (518) 686-7357
Cornwall Paper Mill Farge Hill Rd. Cornwall, NY 12518	Mr.Thomas Sangiacomo OCC mill, high grades (914) 534-2525
Domtar Packaging/Recycling Division 66 Shorncliff Rd. Toronto, Ontario, Canada M8Z 5K1	Mr. Greg A. Scott OCC, high grades (416) 232-8846
Formisano Recycling 21 Johnes St. Newburgh, NY 12550 (also Rt. 9W, Milton)	Mr. John Formisano News, OCC, high grades, mags., etc.(914) 562-1790 (914) 795-5744
Fox Run Recycling, Inc. P.O. Box 256 North Branch, NY 12766	Mr. Craig Reimer MRF: News, OCC, high grades (914) 482-4400
Garden State Recycling Corp. Subsidiary of Garden State Paper Co. River Drive Center 2 Elmwood Park, NJ 07407	Mr. John Stanton (Bruno & D'Elia) News mill (201) 796-0600
Great Northern Paper One City Center P.O. Box 900 Portland, Maine 04104-0900	Mr. Raymond Taylor News mill (207) 774-5700
Hudson Baler (Baylor) 220 Dupont Ave. P.O. Box 947 Newburgh, N.Y. 12550	Mr. Timothy Flanagan MRF: OCC (914) 561-0167
James River Corp. 1 River St. So. Glenn Falls, NY 12803	Mr. Jeff Davis High Grades (518) 793-5684
J.C. Paper 57 Fulton Street Poughkeepsie, N.Y. 12601	Mr. Ron Chugerman News, OCC, high grades (914) 454-2170
Karta Container & Recycling 1011 Lower South St. Peekskill, NY 10566	Mr. Pasquale Cartalemi MRF: News, OCC, high grades (914) 737-9017
Kruger Recycling Inc. 3285, Chemin Bedford Montreal (Quebec) Canada H3S 1G5	Richard Lloyst Loose or baled ONP (514) 737-1131

Laidlaw Resources Division of Laidlaw Waste Systems 2651 John St., Unit 1-A Markham, Ontario Canada L3R 2W5	Mr. Carl Brown News--No. 6 (Reg.) $+25/ton baled (416) 475-2925
Laidlaw Waste Systems 3221 N. Service Road Burlington, Ont. Cananda L7N 3G4	Mr. Jack Mc Ginnis News and magazines (416) 336-5151
Marcal Paper Mills Inc. 1 Market St. Elmwood Park, NJ 07407	Mr. Elio Travato/ Ms. Nadine Mariconda Junk mail, catalogs, inserts (201) 796-4000
National Resource Recovery Riverview Industrial Park P.O. Box 598 Marlboro, N.Y. 12542 (closed May, 1991)	Ms. Randy Schiller High grades/destruction (914) 236-7800 (formerly Nat'l Recycling)
North American Recycling Box 868 Glens Falls, NY 12801	Mr. Robert Barber OCC, Brown paper bags (518) 747-2596
North American Recycling Port of Albany Albany, NY 12202	Mr. Elliot Leberman News, OCC, high grades & plastic (518) 463-4432
Paper Trade U.S.A., Inc. 337 17th St., Suite 211 Oakland, Calif. 94612	Ms. Louise Law All grades, baled for export (415) 465-1986
Reclamation Industries 413 Kenwood Ave. Delmar, NY 12054	Dr. Michael Khamis (518) 272-6751 ONP, OCC, High grades, Plastic
Recycle Material, Inc. 70 Don Bosco Place Port Chester, N.Y. 10573-8588	Mr. Michael Martinelli High grades only (914) 939-7878
Red Hook Paper Spring Lake Road Red Hook, N.Y. 12571	Mr. Barry Hull News, OCC, phone books, soft & hard cover books (914) 758-9200
RRT Empire Returns Corp. 101 Kuhn Rd. P.O. Box 536 Syracuse, NY 13211-05	Mr. Roger Guttentag MRF: News, OCC, high grades (315) 455-7080
Sonoco Products 58-61 Forest Ave. Amsterdam, NY 12010	Mr. Earl Marshall ONP and OCC (518) 842-1010
Stone Container Corp. P.O. Box 1500 Uncasville, Ct. 06382	Mr. Ed Regan Baled OCC (203) 848-1500

Thruway Paper Recycling
22 North Armont Road
Suffern, N.Y. 10901

Mr. Tom Vizioli
News--Garden State broker
(914) 357-5000

U.S. Recycling Industries
(Waste Management of N. America)
475 Ludwig Avenue
Buffalo, N.Y. 14227

Mr. Richard S. Gordon
All paper
(716) 891-6300

Yank Waste Company, Inc.
112 Old Karner Rd.
Albany, N.Y. 12212

Mr. David Aronson
High grades
(518) 456-2345

OCC = Old corrugated cardboard

MRF = Materials Recovery Facility

Paper Industry:

American Paper Institute
(212) 340-0600 260 Madison Ave.
New York, NY 10016

(800) 878-8878 (Literature)
(202) 463-2427 Bob McKernan

Institute of Scrap Recycling Industries
1627 K Street N.W.
Washington, D.C. 20006

(Publish Scrap Specifications Circular)

(202) 466-4050
"Guidelines for Paper Stock: PS-88 - Export Transactions" for paper industry specs.

PLASTIC:

Bronx 2000 1809 Carter Avenue Bronx, N.Y. 10457	Mr. Michael Schedler; David Hurd; all resins (212) 731-3931
Clearvue Resource Management 1 Clearvue Drive P.O. Box 8 Amsterdam, N.Y. 12010	Mr. Dave McCraw (518) 842-7134 (518) 786-6210 Fax HDPE, PETE, PVC, PP
C-M Fiber Route 31 Port Byron, NY 13140	(315) 776-5716
CVM Plastics, Inc. 261 Bellwood Park Rd. Asbury Park, N.J. 08802	Mr. Robert Voight (908) 248-8080 HDPE, PETE, "mixed"
Day Products 540 Pedricktown Rd. Box 313 Bridgeport, N.J. 08014	Mr. Edmond J. Carerras (609) 467-5522 PETE only
Eaglebrook Plastics, Inc. 2600 W. Roosevelt Rd. Chicago, IL 60608	Mr. Eric Liewergen (312) 638-0006 HDPE, PETE
Fox Run Recycling, Inc. P.O. Box 256 North Branch, N.Y. 12766	Mr. Craig Reimer MRF: HDPE, PETE (914) 482-4400
Hudson Baler Corp. 220 Dupont Ave. P.O. Box 947 Newburgh, N.Y. 12550	Mr. Timothy Flanagan MRF: HDPE, PETE (914) 561-0167
J.C. Paper Co. 57 Fulton Street Poughkeepsie, N.Y. 12601	Mr. Ron Chugerman Paper, PET, HDPE (914) 454-2170
Karta Container & Recycling 1011 Lower South Street Peekskill, N.Y. 10566	Mr. Pasquale Cartelemi MRF: HDPE, PETE, PVC, PP, PS (914) 737-9017 or 9211
M.A. Industries, Inc. P.O. Box 2322, 303 Dividend Drive Peachtree City, GA 30269	Ms. Gail Brown (404) 487-7761 HDPE, PETE
Metropolitan Mining Co., Inc. 58-30 57th St. Maspeth, NY 11378	Mr. Ken Flood (718)-894-5025 or Bottle bill PET
Municipal Recycling Associates 3 West Main St. Elmsford, NY 10523	Union Carbide rep. Mr. Angelo Rubbo
National Polystyrene	(508) 667-0096 Hal McCaughnery

North American Plastics Recycling Toe Path Rd. Ft. Edward, NY 12828	Mr. Tom Tomaszek (800) 543-8473 #1,2,3,5,7 ketchup bottles, H/LDPE film
Nicon Plastics, Inc. 4-11 47th Avenue Long Island City, N.Y. 11101	Leslie Miller (718) 392-1177 PETE only
Occidental Chemical Corporation P.O. Box 1772 Berwyn, PA 19312	Mr. William Carroll, Jr. (215) 251-1000 PVC only
Plastics Again/Genpak 68 Warren St. Box 727 Glens Falls, NY 12801	Mr. Damon Georgia (518) 798-9511 Polystyrene food service and packing foam (EPS)
Plastic Recycling Alliance Chadds Ford Business Campus Brandywine 2, Suite 202A Rts 1 & 202 Chadds Ford, PA 19317	Mr. Ryan F. McKendrick (215) 558-1257 HDPE, PETE
Plastics Recovery Corporation P.O. Box 7080 75 Daggett St. New Haven, CT 06519	Ms. Nancy Feresten (203) 785-0458 HDPE, PETE
Reclamation International Inc. 413 Kenwood Ave. Delmar, NY 12054	Mr. Nick Ferez (800) 848-9575 (518) 475-0875
RRT Empire Returns Corp. 101 Kuhn Rd. P.O. Box 536 Syracuse, N.Y. 13211-0536	Mr. Roger Guttentag (315) 455-7080 MRF: HDPE, PETE
St. Jude Polymers 400 S. Broad Street Frackville, Pa 17931	Mr. Steve Babianchak (717) 674-1220
Trimax Plastic Lumber R.D. 1 Box 1303 Fort Ann, N.Y. 12827	Anthony Noto/John Aspland (518) 792-6341 (Mixed) HDPE, PETE, PVC, PP
Union Carbide P.O. Box 670 Bound Brook, NJ 08805	Ms. Diane Mensinger HDPE, PET (201) 563-6080
Wellman, Inc. 440 Daniels Drive, R.D. 6 Allentown, PA 18106	Daniel J. Brosey (215) 481-9240 HDPE, PETE
Wellman Plastics 1040 Broad Street, Suite 302 Shrewsbury, N.J. 07702	Ms. Caroline Mixon Mr. Bob Daston (201) 388-0120 HDPE, PETE

LOCAL PACKING COMPANIES ACCEPTING STYRENE FOAM PACKING CHIPS:

Pack & Send
58 Main St.
New Paltz, NY 12561
(914) 255-1392

Pak-Mail
1128 Morton Blvd.
Kingston, NY 12401
Ms. Diane Abbey
(914) 336-2067

Post Express
93 Tinker St.
Woodstock, NY 12498
(914) 679-8360

Parcel Express
R.D. 2 Box 247
Route 28
Kingston, NY 12401
Mr. Robert Hooper
(914) 339-7900

Plastics Industry:

Center for Plastics Recycling Research
Rutgers University
Building 3529-Busch Campus
Piscataway, NJ 08855
Mr. Darrell Morrow
Mr. Ray Ching
(201) 932-3683

Council for Solid Waste Solutions/ Plastics Recycling Foundation
1275 K St. N.W.
Washington, D.C. 20005
(202) 371-5319
(202) 372-5200

Also, Society of the Plastics Industry (plastics coding system).

STEEL CANS:

All-Container Recovery Inc. 28 Howard St. Piscataway, NJ. 08854	Mr. Thomas Mele (201) 752-8823
Allied Metal Group/ AMG Resources Corp. 4100 Grand Ave Pittsburgh, Pa. 15225	Mr. Robert A. Chevalier (412) 331-0770 Mr. Roger Levine (412) 777-7336 Detinner
Bethlehem Steel Corporation Bethlehem, PA 18016	Mr. James N. Omdahl (215) 694-3114
Boulder Resources/Pascap Co., Inc. 505 W. 27th St. New York, NY 10001	Mr. Leonard Formato (212) 947-2985 (Proler broker)
Chas. Effron & Sons 167 Smith St. Poughkeepsie, NY 12602	Mr. Dick Sweeney Scrap metal and cans (914) 471-0820
Ellenville Scrap Metal 34 Cape Rd. Ellenville, NY 12428	Mr. Al Koplick Scrap metal and cans (914) 647-5460
Fox Run Recycling, Inc. P.O. Box 256 North Branch, N.Y. 12766	Mr. Craig Reimer Multi-material broker (914) 482-4400
Hudson Baler Corp. 220 Dupont Ave. P.O. Box 947 Newburgh, N.Y. 12550	Mr. Timothy Flanagan (914) 561-0167
Karta Container & Recycling 1011 Lower South Street Peekskill, N.Y. 10566	Mr. Ken Cartelemi (914) 737-9211
Metals Unlimited Morrisonville, NY 12962	Mr. Randy Fink (518) 563-1628
B. Millens and Sons 290 E. Strand Kingston, N.Y. 12401	Mr. Barney Millens (metal cans to Effron) (914) 331-7600
Proler International Corp. P.O. Box 286 Houston, TX. 77001	Mr. Phillip Greenberg (713) 671-5952 Detinner
RRT Empire Returns Corp. 101 Kuhn Rd. P.O. Box 536 Syracuse, N.Y. 13211-0536	Mr. Roger Guttentag Mr. David Weitzman (315) 455-7080
U.S. Steel - Tin Mill Products 600 Grant Street Pittsburgh, PA 15219-4776	Mr. Robert A. Meyers (412) 433-4070
West Shore Recycling, Inc. Box 677 Kauneonga Lake, NY 12749	Mr. Joel Shapiro (914) 583-4634

Steel Can Industry:

Steel Can Institute
680 Anderson Drive
Pittsburgh, Pa. 15220

Greg Crawford
Industry Assoc.
(412) 922-2772

MULTI-MATERIALS:

All Container 28 Howard Street Piscataway, N.J. 08854	Mr. Tom Mele President (201) 752-8823
Fox Run Recycling, Inc. P.O. Box 256 North Branch, N.Y. 12766	Mr. Craig Reimer Multi-material broker (914) 482-4400
Hudson Baler Corp. 220 Dupont Ave. P.O. Box 947 Newburgh, N.Y. 12550	Mr. Timothy Flanagan (914) 561-0167
Karta Container & Recycling 1011 Lower South Street Peekskill, N.Y. 10566	Mr. Ken Cartelemi (914) 737-9211
Metropolitan Mining Co., Inc. 58-30 57th St. Maspeth, NY 11378	Mr. Ken Flood (718) 894-5025 or Bottle bill materials and OCC
New England CRINC. 74 Salem Road N. Billerica, Ma. 01862	Mr. Hal McGaughey Sales and Business Development
North American Recycling Corp. Box 868 Glens Falls, N.Y. 12801	Mr. Robert R. Barber (518) 747-4183 (518) 747-2596 (fax)
T.A. Predel & Co. Box 644/201 Edson Ave. Schenectady, NY 12301	Mrs. Mary Predel (518) 346-3445
Resource Recovery Systems Inc. P.O. Box 501 Old Lyme, Ct. 06371	Mr. Peter Karter President (203) 434-9635
RRT Empire Returns Corp. 101 Kuhn Rd. P.O. Box 536 Syracuse, N.Y. 13211-0536	Mr. Roger Guttentag Mr. David Weitzman (315) 455-7080

AUTO BATTERIES:

Revere Smelting & Refining (RSR) Corp. of NJ
RD 2 Ballard Rd.
Middletown, NY 10940

Joanne
(914) 692-4414

Use 30-day contract for trailer loads (4,500 lbs):

RSR Corp. (Main Office)
1111 West Mockingbird Lane
Dallas, Texas 75247

Tom Kelly/Marty Goldstein
(800) 527-9452

HOUSEHOLD BATTERIES:

Mercury Refining
790 Watervliet-Shaker Road
Latham, NY 12110

Mr. David Cohen
Household batteries
(518) 785-1703

C & D/WOOD WASTE:

Edgemere Development Corp.
U.P.O. Box 3155
Kingston, NY 12401

Mr. Michael Guntlow
C&D sorting and processing
(914) 338-8011

Forest Products, N.E., Ltd.
P.O. Box 949
Gloversvillle, NY 12078

Mr. William Glover
Wood waste processor
(518) 773-8786

Taylor Tree Farm
172 Neelytown Road
Montgomery, NY 12549

Ms. Dorothy L. Taylor
Grind tree stumps
(914) 561-3490

FREON:

Especially Swedish Auto Repair
7292 Route 212
Saugerties, NY 12477

(914) 246-3029
Freon removed from air-conditioners, etc. at n/c by appointment only

PAINT:

Dutch Boy/Sherwin Williams Paint
101 Prospect Ave. NW
Cleveland, Ohio 44115-1075

Mr. John Gerulis
(216) 566-2239

RENDERERS:

Darling Delaware, Inc. of Newark, NJ

J & S Reliable, Matamoras, PA. (717) 491-4318 Jack LaBerta (contact through Jack's Prime Meats in New Paltz (914) 255-9728

Mopac of Sauderton, PA

Western Massachusetts Rendering of Southwick, MA

Coreneco of Tewsbury, MA.

SCRAP METAL:

Brim Recyclers Cuddebackville, NY	(914) 745-7671
Buck's Used Auto Parts (Rt. 213, Eddyville) P.O. Box 2462 Kingston, NY 12401	Mr. Frank Pronesti Used autos & parts (914) 338-3131
Consolidated Scrap Metal P.O. Box 245 Newburgh, NY 12550	Mr. Larry Caine Ferrous & non-ferrous (914) 561-4342
Chas. Effron & Sons 167 Smith St. Poughkeepsie, NY 12602	Mr. Dick Sweeney Ferrous & non-ferrous (914) 471-0820
Ellenville Scrap Metal 34 Cape Rd. Ellenville, NY 12428	Mr. Al Koplick Ferr., non-ferr., cans (914) 647-5460
Kingston Recycling, Inc. 642 Abeel St. Kingston, NY 12401	Mr. Bob Metz Scrap metal/junk cars (914) 331-3312
MAC Industries 1320 Kings Highway Cutoff Fairfield, CT 06430	Mr. Paul Uhrynowski Ferrous & non-ferrous (203) 259-9776
Metals Unlimited Morrisonville, NY 12962	Mr. Randy Fink Ferrous & non-ferrous (518) 563-1628
Mike's Scrap Metal 299 S. Wall St. Kingston, NY 12401	(914) 331-4027 Non-ferrous scrap
B. Millens and Sons 290 E. Strand Kingston, N.Y. 12401	Mr. Barney Millens Ferr., non-ferr., cans (914) 331-7600
Northern Car Crusher Keeseville, NY	Mr. Gary Woodside (518) 834-7571
P & D Surplus 198 Abeel St. Kingston, NY 12401	Mr. Donald Hines Non-ferrous scrap metal (914) 338-6191
West Shore Recycling, Inc. Box 677 Kauneonga Lake, NY 12749	Mr. Joel Shapiro Ferrous scrap, white goods (914) 583-4634

TEXTILES:

Scott Cynamon Textiles, Inc. 102 Luquer St. Brooklyn, NY 11231-3309	Mr. Scott Cynamon (718) 858-3065 Used clothing, textiles

TIRES:

Casings, Inc. P.O. Box 731 Catskill, NY 12414	Mr. Jim Fabrizio Permitted NYSDEC (518) 943-9404
Coletta Recycling Corporation 1629 Redfern Ave. Far Rockaway, NY 11691	Mr. Michael Coletta Exempt from permit (718) 327-4740
Integrated Tire 333 Ganson St. Buffalo, NY 14202	Mr. Lenny Bevilacqua Permitted NYSDEC (716) 847-8473
Mohawk Tire Storage Facility 1 Schoolhouse Lane P.O. Box 234 Waterford, NY 12188	Vince Williamson or Bob Gensler - Under consent order - permit pending (518) 237-3727 or 237-7055
North American Tire Recycling Corp. P.O. Box 324 Ft. Edward, NY 12828 or Riverside Avenue Rensselaer, NY 12144	Mr. Sid Gordon (800) 543-TIRE (8473) (518) 747-4183 Permitted NYSDEC Plant: Arlen Anderson (518) 273-4125
Oxford Tire (formerly Conn. Tire) 40 E. Dudlytown Road Bloomfield, Conn. 06002	Glenn (203) 242-8068 Call for appointment to deliver
Oxford Tire 1414 Norwich Road Plainfield, Conn. 06374-1931	Mr. Ron Teitelbaum (800) 873-8473 or (203) 564-7800 Call for load to be picked up
Shaker Tire/Disonell Enterprises 1003 9th Avenue and Route 155 Watervliet, NY 12189	Mr. Carl Disonell Permitted NYSDEC (518) 273-4125
Tire Recycling Inc. Quarry Road P.O. Box 264 Saugerties, NY 12477	Mr. Bill Reinhardt (914) 246-0700 Under consent order - permit pending

Tire Processing Systems:

Tirec Systems, Inc. Polhemus Lane P.O. Box 6867 Bridgewater, NJ 08807	Tom Mancuso Steve Yacus (201) 271-5816

Process for grinding rubber tires for use in rubber asphalt aggregate, road patch, roofing compound, etc. Steel recycled as scrap; looking for uses for polyester "fuzz." Recommends **Pol-X** for remolding of tires with usable casing.

WASTE OIL:

BresLube USA, Inc./Safety-Kleen P.O. Box 637 Floral Park, NY 11002	Mr. Michael Sommer (519) 648-2291
Environmental Recycling Associates 16 Wilson Road Monroe, N.Y. 10950	Sal, Dispatcher Frank Capano, Driver for Ulster Co. route (800) 526-5335
S & M Waste Oil, Inc. P.O. Box 62 Ogdensburg, NJ 07439	(201) 827-8015

12.5 RECYCLING SURVEY

The following Survey has been prepared by the UCRRA and is being distributed to over 50,000 residences in Ulster County. The results will be analyzed and used to better predict Separation Efficiencies and participation rates in Ulster County recycling / composting programs.

RECYCLING SURVEY

PLEASE LET US KNOW WHAT YOU THINK!

Your thoughts and suggestions will help us to evaluate our recycling program and to better provide you with the services you want.

Village of _____

of _____

ty of _____

ber of persons in household _____

age of person filling out this survey (check one):
☐ Under 21 ☐ Between 21-40
☐ Between 41-64 ☐ 65 and over

ive in a: . . . which I:
☐ Single family dwelling ☐ rent.
☐ Multi-family dwelling ☐ own.

ype of recycling program available at my cation (check one):
☐ Curbside collection by hauler
☐ Recycling drop-off center
☐ Both
☐ No program ☐ Don't know

his recycling program is:
☐ Voluntary ☐ Mandatory ☐ Don't know

he household recycles (check one):
☐ Always ☐ Usually
☐ Rarely ☐ Never

o you recycle where you work?
☐ Yes ☐ No

o you think recycling is a good idea?
☐ Yes ☐ No

o you plan to start or continue recycling now?
☐ Yes ☐ No

o you think your neighbors will recycle?
☐ Yes ☐ No

o you find recycling easy?
☐ Yes ☐ No

o you find recycling confusing?
☐ Yes ☐ No

Separation, Preparation & Collection:

12. What materials are being recycled in your household now? (Check all that apply):
☐ Newspaper ☐ Magazines
☐ Glass bottles & jars ☐ "Junk mail"
☐ Corrugated cardboard ☐ Scrap metal/Appliances
☐ Metal cans ☐ Tires
☐ Plastic bottles & jugs ☐ Waste oil
☐ Office/Computer paper ☐ Auto batteries
☐ None ☐ Other _____

13. Would you be willing to separate additional materials for recycling?
☐ Yes ☐ No ☐ Undecided

14. Would you be willing to **separate** your waste into the following categories?
a) Paper recyclables (newspaper, cardboard, etc.) ☐ Yes ☐ No
b) Container recyclables (glass & plastic bottles, metal cans ☐ Yes ☐ No
c) Compostables (yard & food waste) ☐ Yes ☐ No
d) Household hazardous waste ☐ Yes ☐ No
e) Other trash (garbage that goes to landfill) ☐ Yes ☐ No

15. The time it takes me to **prepare** materials for recycling at home is (check one):
☐ Too much ☐ About right
☐ Too little ☐ I don't recycle

16. Would you be willing to spend more time to recycle more materials?
☐ Yes ☐ No ☐ Undecided

17. My recyclables are collected (check one):
☐ At home (curbside), the same day as trash.
☐ At home (curbside), a different day than my trash.
☐ At the drop-off station where I deposit trash.
☐ At the drop-off station I use for recycling only.
☐ There is no recycling program available to me.

18. The recycling **collection** system I use is:
☐ Very convenient ☐ Somewhat convenient
☐ Not convenient

19. Why? _____
_____

Composting:

20. Do you compost in your back yard?
Yard waste: ☐ Yes ☐ No
Kitchen waste: ☐ Yes ☐ No

21. Do you burn in your back yard?
Yard waste: ☐ Yes ☐ No
Paper waste: ☐ Yes ☐ No
Other waste: ☐ Yes ☐ No

22. Do you use your municipal yard waste composting program?
☐ Yes ☐ No ☐ None available

23. Should burning of yard waste be prohibited?
☐ Yes ☐ No

24. Should burning of recyclables (paper, plastic) be prohibited)?
☐ Yes ☐ No

Cost and Other Considerations:

25. How would you rank your reasons for recycling? (1 thru 5)
____ Environmental
____ Economic
____ Legal
____ Everyone is doing it
____ Do the right thing

12 - 49

26. If necessary, would you be willing to pay for recycling?
☐ Yes ☐ No ☐ Undecided

27. If yes, how much would you be willing to pay (per month)?
a) Collected at curbside? _____
b) Brought to recycling center? _____

28. A "pay by the bag" system for **non-recyclable** trash is:
☐ A good idea ☐ Okay ☐ Not a good idea

29. Have you changed your buying habits to favor reusable or recyclable products and packaging (**"precycling"**)?
☐ Yes ☐ No
☐ Need more information

Mandatory Source Separation of Recyclables:
Recycling will be mandated by law in Ulster County later this year and throughout New York State by September 1, 1992. This law will include residents, multi-family dwellings, businesses, institutions, municipalities, and haulers.

30. Any comments regarding mandatory source separation/recycling?

_____

Recycling Information:

31. If you have not recycled before getting this recycling container and information packet, please explain why:
    - [ ] I didn't have enough information about preparing the materials.
    - [ ] I didn't have enough information about where to take the materials.
    - [ ] I didn't know which materials were recyclable.
    - [ ] I didn't think it was important.
    - [ ] I just never thought about it.
    - [ ] I have no place to take recyclables.
    - [ ] Other _____

32. I have obtained my previous recycling information from (check all that apply):
    - [ ] Local newspaper: _____
    - [ ] Local radio or TV station: _____
    - [ ] Town or City recycling information
    - [ ] Recycling Coordinator [ ] Local meetings
    - [ ] UCRRA [ ] Word of mouth
    - [ ] Other sources _____

33. Will your recycling increase with (check all that apply): [ ] Use of recycling container
    - [ ] Mandatory recycling [ ] Curbside collection
    - [ ] Additional materials [ ] Financial incentives
    - [ ] More information
    - [ ] Other _____

34. Did you find the UCRRA recycling kit helpful?
    [ ] Yes [ ] No [ ] Haven't read it yet

35. Had you heard of the UCRRA before receiving this information? [ ] Yes [ ] No

36. Please add any comments about recycling, this recycling kit, the UCRRA, or other concerns in the space below. We want to hear from you.

_____

_____

UCRRA Recycling Helpline:

From: _____

TO:
"RECYCLING PAYS OFF!" SWEEPSTAKES/SURVEY
ULSTER COUNTY RESOURCE RECOVERY AGENCY
52 MAIN STREET / P.O. BOX 4298
KINGSTON, NY 12401

PLACE STAMP HERE

Recycling Pays Off!

Sweepstakes & SURVEY

Complete this survey and you could win

$250.00 !

Recycling pays off in many ways:

- It saves resources.
- It reduces pollution.
- It saves money.
- It gives you a chance to make a difference in solving our solid waste problem.
- It will make you feel good.
- It will soon be the Law!

. . . AND it could win you $250.00!

Please take a few minutes to fill out this questionnair
Return it to your Recycling Center or fold it with t
address of the Ulster County Resource Recove
Agency on the outside, put on a stamp and mail
(Drawing will be held September 30, 1991, to allo
all towns to participate.)

The information from this survey will be used by t
Ulster County Resource Recovery Agency (UCRR
and Municipal Recycling Coordinators to better pl
our Recycling Programs.

Results will be published in local media.

Optional (if you win, we must know how to conta
you):

Name _____

Address _____

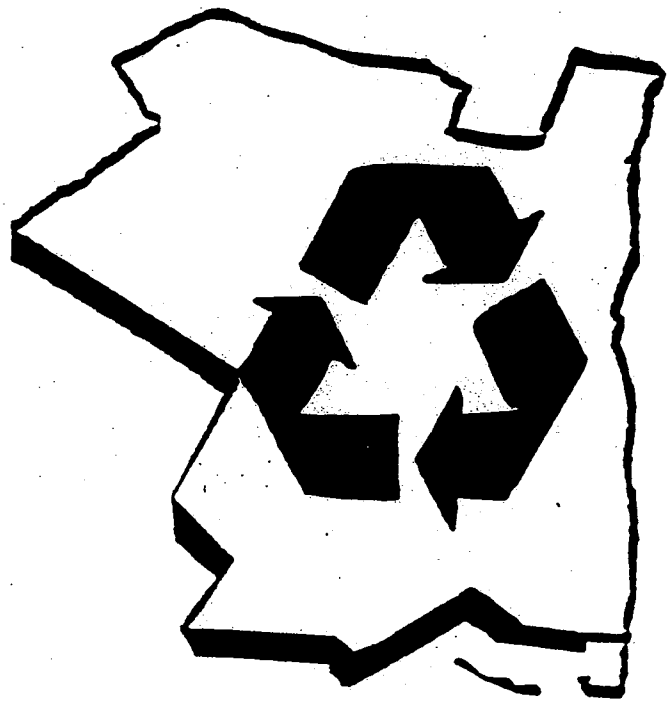
Town/City _____ Zip _____

Telephone _____ Date _____

Printed on recycled paper.

VOLUME II

FIRST MODIFICATION
to
THE ULSTER COUNTY
SOLID WASTE MANAGEMENT PLAN

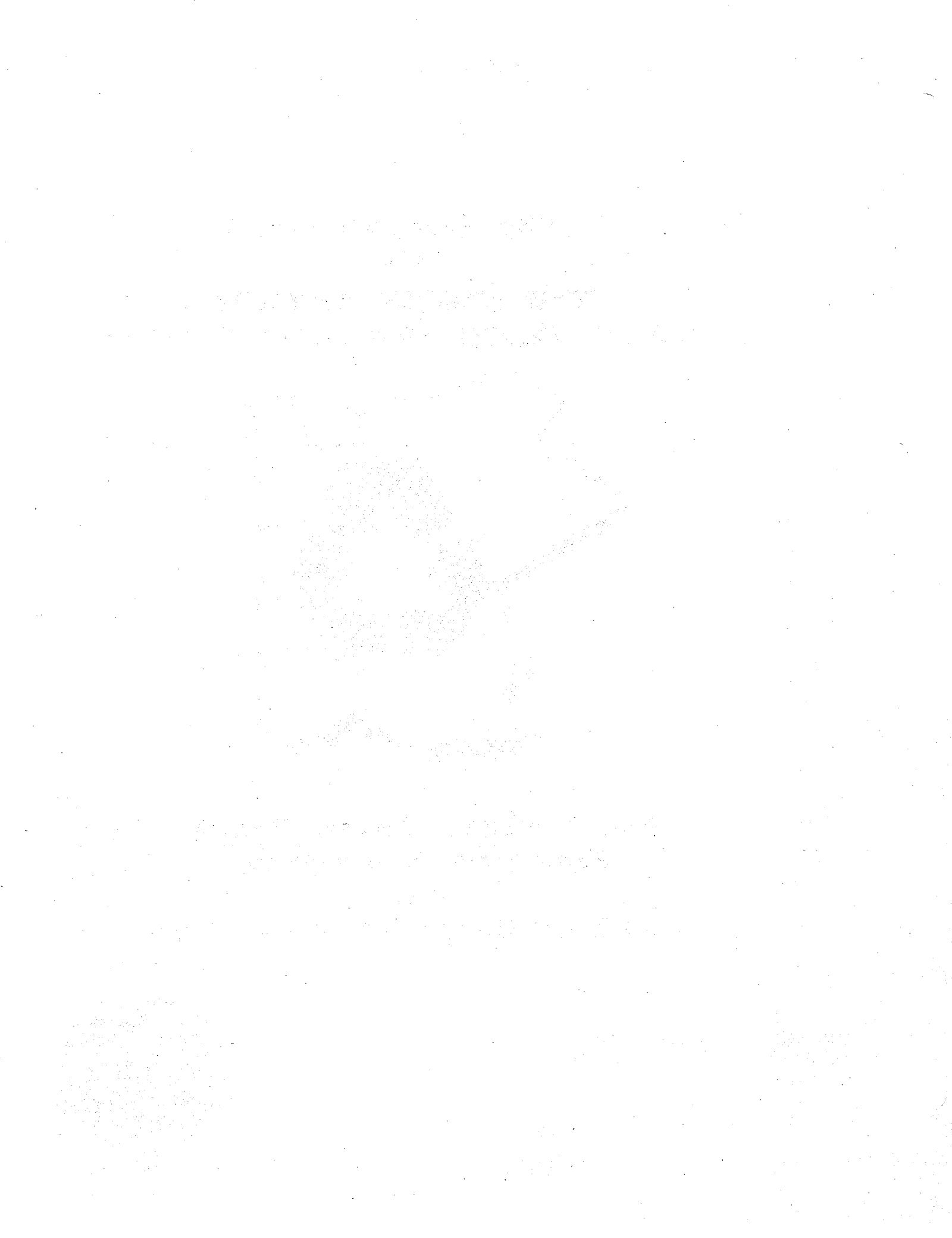


The Interim Solid Waste Management Program and Landfill Consolidation Plan

Modified - August, 1992
(Changes Incorporated Herein and in Volume I)

PRINTED ON RECYCLED PAPER

ULSTER COUNTY RESOURCE RECOVERY AGENCY
SEAL OF ULSTER COUNTY
STATE OF NEW YORK
1987



14-16-4 (2/87)—Text 12

PROJECT I.D. NUMBER

617.21

Appendix C

State Environmental Quality Review

SEQR

SHORT ENVIRONMENTAL ASSESSMENT FORM

For UNLISTED ACTIONS Only

PART I—PROJECT INFORMATION (To be completed by Applicant or Project sponsor)

1. APPLICANT /SPONSOR
Ulster County Resource Recovery Agency

2. PROJECT NAME Interim Solid Waste Management Program

3. PROJECT LOCATION:
Municipality N/A County Ulster

4. PRECISE LOCATION (Street address and road intersections, prominent landmarks, etc., or provide map)
Project is County-wide. 3 existing municipal landfills (Towns of New Paltz,Ulster and Wawarsing) will be used as consolidation landfills to receive solid waste generated within the County. Other existing landfills in 12 locations will be closed.

5. IS PROPOSED ACTION:
☐ New ☐ Expansion ☒ Modification/alteration

6. DESCRIBE PROJECT BRIEFLY: Agency is modifying its approved solid waste management plan("SWMP") to provide for the management of solid waste in the County until 6 NYCRR Part 360 County-wide landfill is operational. Agency will prepare modified language to the SWMP, a landfill consolidation plan and agreements with the municipalities to provide solid waste management during the interim period.(See attached Exhibit "1" for further discussion)

7. AMOUNT OF LAND AFFECTED:
Initially _____ acres Ultimately _____ acres County-wide

8. WILL PROPOSED ACTION COMPLY WITH EXISTING ZONING OR OTHER EXISTING LAND USE RESTRICTIONS?
☒ Yes ☐ No If No, describe briefly

9. WHAT IS PRESENT LAND USE IN VICINITY OF PROJECT?
☐ Residential ☐ Industrial ☐ Commercial ☐ Agriculture ☐ Park/Forest/Open space ☐ Other
Describe: Land use in vicinity of the existing landfills is for landfill operation as existing facilities are to be used.

10. DOES ACTION INVOLVE A PERMIT APPROVAL, OR FUNDING, NOW OR ULTIMATELY FROM ANY OTHER GOVERNMENTAL AGENCY (FEDERAL, STATE OR LOCAL)?
☒ Yes ☐ No If yes, list agency(s) and permit/approvals NYSDEC must issue revised consent orders and approve landfill consolidation plan pursuant to enforcement powers and NYSDEC must approve SWMP modifications. Municipalities must approve agreements with Agency.

11. DOES ANY ASPECT OF THE ACTION HAVE A CURRENTLY VALID PERMIT OR APPROVAL?
☒ Yes ☐ No If yes, list agency name and permit/approval Existing landfills are operating under consent orders from NYSDEC which will be revised. NYSDEC has approved SWMP which is to be modified.

12. AS A RESULT OF PROPOSED ACTION WILL EXISTING PERMIT/APPROVAL REQUIRE MODIFICATION?
☒ Yes ☐ No Consent orders must be revised; SWMP must be modified.

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: _____ Date: _____

Signature: _____

If the action is in the Coastal Area, and you are a state agency, complete the Coastal Assessment Form before proceeding with this assessment

OVER

PART II—ENVIRONMENTAL ASSESSMENT (To be completed by Agency)

A. DOES ACTION EXCEED ANY TYPE I THRESHOLD IN 6 NYCRR, PART 617.12? If yes, coordinate the review process and use the FULL EAF.

☐ Yes ☒ No

B. WILL ACTION RECEIVE COORDINATED REVIEW AS PROVIDED FOR UNLISTED ACTIONS IN 6 NYCRR, PART 617.6? If No, a negative declaration may be superseded by another involved agency.

☐ Yes ☒ No

C. COULD ACTION RESULT IN ANY ADVERSE EFFECTS ASSOCIATED WITH THE FOLLOWING: (Answers may be handwritten, if legible)

C1. Existing air quality, surface or groundwater quality or quantity, noise levels, existing traffic patterns, solid waste production or disposal, potential for erosion, drainage or flooding problems? Explain briefly: NO. Environment will be improved by closing non-complying landfills sooner and in coordinated manner. Consolidation landfills will be operated and closed under stricter requirements. Traffic impacts will be minimal.

C2. Aesthetic, agricultural, archaeological, historic, or other natural or cultural resources; or community or neighborhood character? Explain briefly:

NO. Existing facilities will be used.

C3. Vegetation or fauna, fish, shellfish or wildlife species, significant habitats, or threatened or endangered species? Explain briefly:

NO. Existing facilities will be used.

C4. A community's existing plans or goals as officially adopted, or a change in use or intensity of use of land or other natural resources? Explain briefly.

Existing SWMP calls for solid waste management by Agency and a County-wide system. Project is a step toward this ultimate goal. Consolidation landfills will receive potentially more solid waste but only to extent of existing capacity. Increase in traffic minimal.

C5. Growth, subsequent development, or related activities likely to be induced by the proposed action? Explain briefly.

No growth is anticipated because of the project.

C6. Long term, short term, cumulative, or other effects not identified in C1-C5? Explain briefly. Environmental benefits: non-complying landfills closed sooner, in coordinated fashion, with additional funding to localities for closure. Consolidation landfills closed under revised 6 NYCRR Part 360 regulations and not old, more lax regulations. Economic: total cost of solid waste disposal to decrease, on average, throughout the County.

C7. Other impacts (including changes in use of either quantity or type of energy)? Explain briefly.

May involve some increase in electric usage to run small compactor roll-off trailers at municipal drop-off sites; additional Agency staff costs.

D. IS THERE, OR IS THERE LIKELY TO BE, CONTROVERSY RELATED TO POTENTIAL ADVERSE ENVIRONMENTAL IMPACTS?

☐ Yes ☒ No If Yes, explain briefly

PART III—DETERMINATION OF SIGNIFICANCE (To be completed by Agency)

INSTRUCTIONS: For each adverse effect identified above, determine whether it is substantial, large, important or otherwise significant. Each effect should be assessed in connection with its (a) setting (i.e. urban or rural); (b) probability of occurring; (c) duration; (d) irreversibility; (e) geographic scope; and (f) magnitude. If necessary, add attachments or reference supporting materials. Ensure that explanations contain sufficient detail to show that all relevant adverse impacts have been identified and adequately addressed.

☐ Check this box if you have identified one or more potentially large or significant adverse impacts which **MAY** occur. Then proceed directly to the FULL EAF and/or prepare a positive declaration.

☐ Check this box if you have determined, based on the information and analysis above and any supporting documentation, that the proposed action **WILL NOT** result in any significant adverse environmental impacts **AND** provide on attachments as necessary, the reasons supporting this determination:

Name of Lead Agency

Print or Type Name of Responsible Officer in Lead Agency

Title of Responsible Officer

Signature of Responsible Officer in Lead Agency

Signature of Preparer (If different from responsible officer)

Date

VOLUME II

List Of Contents

Ulster County Resource Recovery Agency
52 Main Street, P.O. Box 4298
Kingston, New York 12401
(914) 339-1223

1987

EXHIBIT 1.

ULSTER COUNTY RESOURCE RECOVERY AGENCY

SOLID WASTE MANAGEMENT PLAN

INTERIM SOLID WASTE MANAGEMENT PROGRAM

EXHIBIT 1 TO ENVIRONMENTAL ASSESSMENT FORM

1. Modifications to Solid Waste Management Plan
2. Landfill Consolidation Plan - Use of Consolidation Landfills
3. Municipal Solid Waste Management Agreements
4. Revised Consent Orders
5. Landfill Closure Assistance Program
6. Financing Plan

DATED MAY 4, 1992

Introduction

Background

The purpose of this Exhibit is to evaluate in greater detail than permitted in the Environmental Assessment Form the potential environmental effects and benefits of the Ulster County Resource Recovery Agency's proposed Interim Solid Waste Management Program. The focus of the review is on the impact of the proposed landfill consolidation plan and the modification of the existing Solid Waste Management Plan for Ulster County.

The Solid Waste Management Plan ("SWMP") for Ulster County was approved by the Ulster County Resource Recovery Agency ("UCRRA"), the Ulster County Legislature, and the New York State Department of Environmental Conservation ("NYSDEC"). The NYSDEC approval came in December of 1991. The Plan was reviewed pursuant to the New York State Environmental Quality Review Act ("SEQRA") and a Final Generic Environmental Impact Statement and Final Supplemental Generic Environmental Impact Statement were approved and issued by UCRRA. Findings and Supplemental Findings were made by the Agency in October 1990 and January, 1991.

The Agency has begun to implement the SWMP. It presently manages an interim Satellite Aggregation Center system for the receipt, processing and marketing of regulated recyclable materials and has established a municipal yard waste composting program. The Agency is presently preparing a financing plan in accordance with its finding to issue revenue bonds to finance the solid waste management system (the " System"). The SWMP emphasizes public ownership and control of the essential component facilities of the System. The SWMP also calls for solid waste flow control to be established in the form of a local law adopted by the Ulster County Legislature. The Legislature acted in December of 1991 by adopting Local Laws No. 8 and 9 of 1991 which provide for the management of regulated recyclable materials and solid waste, respectively. Both local laws contain solid waste flow control provisions which are to be administered by the Agency.

The SWMP provides for an integrated solid waste system for Ulster County (the "System"). The major Solid Waste management initiatives are fully described in Chapter 9.0 of the SWMP but are summarized here as follows:

- reduction, reuse and recycling program utilizing a satellite aggregation center (SAC) system for aggregation, beneficiation, and marketing of regulated recyclable materials.

- siting, design, permitting, construction and operation of a publicly-owned 6 NYCRR Part 360

sanitary landfill.

- municipal organic solid waste composting system either provided by the private sector or alternatively procured by the Agency.
- household hazardous waste collection facility.
- C&D recycling plan relying on the private sector.
- host community plan.

In order to fund the System, the SWMP calls for the Agency to issue revenue bonds. These bonds would not be the obligation of the State, the County, or any municipal government, nor would the bonds be guaranteed by any one of those governments. The bonds (and other costs of the System) would be paid by revenues received by the Agency from users of the System, and, if required, net service fees to paid by the County. The SWMP also provides for comprehensive control and management of the solid waste stream in the County through the adoption of the local laws described above. These laws authorize the Agency to license of haulers of solid waste and regulated recyclable materials and to direct solid waste and regulated recyclable materials by the Agency to defined solid waste management and recycling facilities.

The SWMP also calls for the negotiation of an agreement with the County which would obligate the County to provide to UCRRA all solid waste and regulated recyclable materials, and for UCRRA to receive, process and dispose of solid waste and receive, process and market regulated recyclable materials. The agreement provides for the payment of the Net Service Fees referred to above in consideration for this service, if revenues generated from the users of the System are not sufficient. The County Legislature has approved the agreement with UCRRA. UCRRA has the agreement under consideration.

The SWMP currently identifies an "Interim Period" (1992-1995) between SWMP approval and operation of System facilities, During the Interim Period, the Agency would construct and operate the SAC System, site, permit and construct the 6 NYCRR Part 360 landfill, and develop the household hazardous waste and composting facilities.

The SWMP documents the existence of 15 municipal landfills in the County. These landfills presently receive the bulk of the solid waste produced in the County. None of them comply with current NYSDEC regulations and each is operating under a consent order issued by NYSDEC and agreed to by the municipality. According to NYSDEC, these facilities will be closed within a short period of time (1 year to 18 months) under the Consent Order. Each municipality is required to submit reports to NYSDEC

concerning the site conditions at the existing landfills. Most have done this. Some have submitted draft closure plans.

The SWMP envisioned that solid waste would continue to be disposed of at the 15 existing municipal landfills until they were closed by NYSDEC or reached their capacity. UCRRA was to cooperate with the County Department of Health, NYSDEC and the towns regarding the closure of the municipal landfills.

In August of 1991, the Chairman of the County Legislature called upon UCRRA to consider whether or not it was possible during the Interim Period, to take over and operate of some of the municipal landfills, and to establish a landfill closure fund which would provide financial assistance to the municipalities to close their landfills in a coordinated and environmentally sound manner. This proposal was studied by UCRRA in cooperation with the NYSDEC and the Ulster County Department of Health.

It has been the subject of extensive public debate at UCRRA meetings, County Legislative meetings and municipal government meetings. Based upon its investigation, discussions with municipal representatives, and public input, UCRRA found that it is feasible to revise the SWMP to provide, during the Interim Period, an interim solid waste management program (the "Action"). The Action consists of the following components:

- modification of the SWMP under NYSDEC guidelines to provide for the interim solid waste management program.

- adoption of a Landfill Consolidation Plan ("LCP") which analyzes the existing municipal landfills under NYSDEC consent orders, provides for closure of the landfills in an orderly fashion, and designates three landfills (the Consolidation Landfills) to be taken over and operated by UCRRA for the benefit of the entire County during the Interim Period.

- acquisition of the Consolidation Landfills under agreements to be negotiated with the respective municipalities.

- negotiation of agreements with the remaining municipalities for solid waste management service by UCRRA.

- development of a landfill closure assistance program ("LCAP") whereby UCRRA would pay a portion of the closure costs of the non-consolidation landfills. The LCAP would be funded by issuing revenue bonds under the UCRRA's financing plan.

- execution of revised Consent Orders with NYSDEC and the Consolidation Landfill towns for operation and closure of the Consolidation Landfills.

- development of the financing plan and issuance of revenue bonds.

SEQRA Framework

UCRRA has been established as Lead Agency and has completed the environmental review of the SWMP under the GEIS. SEQRA provides that when a lead agency completes a generic environmental impact review, future actions must be analyzed to determine if the potential environmental impacts of those actions have been adequately addressed in the GEIS. If they have not, then a supplemental GEIS may be required if the subsequent action is likely to have one or more significant adverse environmental effects. UCRRA as lead agency must take a "hard look" at potential effects. If it determines that the action will not have any significant adverse environmental effects, then a negative declaration can be issued.

The analysis of this action involves a description of the components of the action, an analysis of the potential adverse and beneficial environmental effects of each component and a conclusion as to whether any component, or the action as a whole, may have any significant effects. Finally, a description of involvement of the public in this process is described.

Description of the Action

The action consists of several components, each of which is consistent with the overall goal of the SWMP, that is to provide an environmentally sound and cost-effective solution to solid waste management in the County for a 25 year planning period from 1989-2014. The Action defines a more active role by UCRRA during the Interim Period than originally provided in the SWMP. The new role to be played by UCRRA is one which would: facilitate the implementation of the SWMP by providing for a coordinated closure of non-complying existing municipal landfills; assumption by UCRRA of responsibility for managing the solid waste stream, partial financing to the municipalities for implementation of solid waste facilities called for in the SWMP and financial assistance for closure of the existing landfills. Financing for these efforts and other UCRRA initiatives described in the SWMP would be provided by revenue bonds. Finally, the Action is consistent with the New York State Public Authorities Law, Title 13-G, the Solid Waste Management Act of 1988, the Environmental Conservation Law, 6 NYCRR Part 360 and NYSDEC directives.

Component Parts of the Action

1. Solid Waste Management Plan Modifications

The SWMP has been approved and is being implemented. 6 NYCRR 360-15.11 requires that solid waste management plans should be modified when necessary. Draft guidelines from NYSDEC provide, among other things, that plan amendment becomes necessary when the management or administration of solid waste within a planning unit is to be changed from that described in the approved plan.

The SWMP calls for the administration and management of solid waste by UCRRA. Specifically, under the SWMP, UCRRA is to have authority to direct solid waste generated in the County to recycling or disposal facilities, most of which will be owned and operated by UCRRA. Municipalities are to collect recyclable materials and solid waste, or exercise regulatory control over such collection, and deliver, or cause to be delivered recyclable materials and solid waste to UCRRA facilities. There is no change envisioned in this structure for the long-term SWMP. However, during the Interim Period, UCRRA was to cooperate with regulatory agencies and the municipalities in closing existing landfills and seeing that solid waste was adequately handled. There was no provision in the SWMP for UCRRA to take over responsibility for disposal of solid waste during the Interim Period. UCRRA now proposes to modify the SWMP to include this responsibility during the Interim Period. Essentially, the same functions will be undertaken by the UCRRA and the municipalities as are outlined in the long-term portion of the SWMP. The only difference is that UCRRA will be providing solid waste disposal facilities sooner than envisioned, and, in assuming that responsibility, UCRRA will: take over, operate and close three Consolidation Landfills; contribute to and assist in the closure of the other existing landfills; construct rural Solid Waste transfer stations for all municipalities, and dispose of solid waste at the Consolidation Landfills. A detailed description of these changes is found in Attachment "A" to the Ulster County Landfill Consolidation Plan.

The specific language for modifying the SWMP is provided in Attachment "B". The modifications are not extensive because the SWMP is not being changed in a significant way, only the timing and take over of certain existing facilities is involved. All goals, determination of technologies, and fundamental administration initiatives remain unaltered. The modified language is reviewed below by chapter. (The reader is referred to the respective chapters contained in the approved SWMP dated 12/3/91)

Executive Summary

The proposed modifications make reference to the LCP and LCAP and describe the use of three Consolidation Landfills to

handle solid waste during the Interim Period.

Chapter 1

The modification refers to the use of the Consolidation Landfills during the interim period, the Agency's taking control of the solid waste stream during the interim period through County legislation, the LCP, agreements with the municipalities and the County, and NYSDEC consent orders.

Chapter 6

These modifications describe the use of the Consolidation Landfills during the Interim Period and explain the benefits of this program: coordinated, orderly closure of the landfills so that a municipality always has a place for solid waste to be disposed of; coordinated disposal of the solid waste at the most environmental sound and convenient Consolidation Landfills, coordination of transport of the solid waste and County-wide regulation and control of solid waste haulers, and transfer of cost of landfill operations and at least a portion of the cost of closure, to the UCRRA.

Chapter 9

These modifications describe the component interim period initiatives in greater detail and provide for their implementation, including a schedule for implementation.

2. The Landfill Consolidation Plan ("LCP")

Pursuant to the Action, the Agency has undertaken a study (The Landfill Consolidation Plan (LCP)) of existing municipal landfills to determine which landfills could serve as consolidation landfills for the disposal of solid waste during the interim period. By using the LCP, the NYSDEC will implement the coordinated closure of the remaining non-Consolidation Landfills. The proposed LCP is annexed hereto as Attachment "A".

The objectives of the LCP are fully described in Section III of Attachment "A". In summary, the objectives are to :

- provide for the orderly closure of existing municipal landfills.
- provide technical and financial assistance to the municipalities for closure.
- minimize the environmental impacts of continued operation and closure of the existing landfills.

- avoid financial and generational hardship to the municipalities during the Interim Period.

- provide a smooth transition to the long-term goal of implementing a County-wide 6 NYCRR Part 360 landfill.

- achieving New York State and County goals for solid waste management.

The overriding goal of the LCP is to ensure that the existing landfills are closed in an orderly manner, with the landfills nearest to capacity or having the worst site conditions or most serious environmental problems closing first. A sufficient number of existing landfills (determined to be three under the LCP) would be designated as Consolidation Landfills. They would be closed last, at the time the County-wide Part 360 landfill becomes operational and would provide adequate capacity for disposal of solid waste from the municipalities in the County until then. Each Consolidation Landfill would serve a specific area. Thus, during the closure process there would be no disruption of solid waste disposal. Further and solid waste would be disposed at the most environmentally sound and accessible sites.

The Consolidation Landfills have been selected pursuant to the screening methodology fully described in Section IV.A of the LCP. Generally, selection would be based upon the following factors:

- lack of significant groundwater contamination

- lack of significant environmental and regulatory problems

- acceptability to NYSDEC

- capacity requirements

- strategic location

- willingness of the town to negotiate transfer to the Agency

The LCP documents a review of all site analyses performed under the consent orders to close; visits to the landfills by UCRRA consultants and representatives; discussions with representatives of NYSDEC and the Ulster County Department of Health; capacity analysis; transportation analysis; site specific environmental considerations; and negotiations with the towns where the Consolidation Landfills are located.

The Consolidation Landfills selected in the LCP (New Paltz, Ulster and Wawarsing) are those best satisfying the conditions set forth therein. It is proposed that all solid waste generated within the County would be disposed of at these three Consolidation Landfills, thus allowing the other landfills within the County to close in an orderly fashion. The LCP finds that the capacity requirements for the Interim Period are met by these three facilities. It also outlines which municipalities would use a specific consolidation landfill. Under the interim program, citizens would still be allowed to self-haul their own solid waste and regulated recyclable materials to rural transfer stations and municipal recycling drop-off sites which, in most cases, are located at existing facilities within the respective municipalities.

3. Solid Waste Management Agreements

In order to implement both the LCP during the Interim Period and the SWMP for the long-term period, UCRRA proposes to enter into solid waste management agreements with the City of Kingston and each of the Towns of the County.

The Municipal Solid Waste Management Agreements are proposed in three versions. Current drafts of the agreements are attached. The first version (Attachment C-1) would be entered into by and between UCRRA and those communities which have no existing solid waste management facility. This agreement provides simply for the obligation of UCRRA to receive, dispose of and/or process solid waste during the term of the agreement. The UCRRA will build rural transfer stations for each municipality. The agreement would also obligate UCRRA to receive, process, and market regulated recyclable materials, as that term is defined in Local Law No. 8 of 1991. Finally, the agreement would provide for the establishment of a municipal composting program for brush, yard waste, and clean wood waste. UCRRA has already embarked on an interim program in this regard. This portion of the agreement would confirm the contractual relationship between the parties for this program. The Agreement shall remain in full force and effect as long as any bonds issued by UCRRA are outstanding or until provision has been made for the payment or satisfaction thereof or 2017, whichever first occurs.

The second version of the agreement (Attachment C-2) provides for the same services but between UCRRA and the communities which have existing landfills which are to be closed pursuant to the LCP. This version is the same as version one, except that it has two provisions (Sections "10" and "11") which implement the LCP and the landfill closure assistance plan ("LCAP") which is described below.

Finally, the third version of the agreements (Attachment C-3), provides for the lease of the three existing Consolidation

Landfills by UCRRA and the terms and conditions regarding the operation, monitoring and closure of the Consolidation Landfills. The terms and conditions of the lease are economically beneficial to the host community. First, the host community will receive a payment pursuant to the agreement equal to $1.00 per ton for each ton of solid waste received and disposed of at the landfill. The agreements also provide for the payment of $.25 per ton to be made to the local fire district. A scale and scalehouse which exists at one of the sites will be added by UCRRA to insure that solid waste is accurately measured at the facility.

UCRRA will assume the costs of operations, and will assume the cost of closure and monitoring of the Consolidation Landfill. This will save each of the Consolidation Landfill communities at a minimum one million dollars, based upon cost projections for closure. UCRRA will operate the scale and the UCRRA scalehouse operator will provide the first level of inspection of solid waste to be disposed of at the facility. Only solid waste haulers with existing valid solid waste permits to be issued under Local Law No. 9 of 1991 and the Ulster County Sanitary Code will be allowed to utilize the facility.

Under the agreements, the town governments will continue to operate the landfills on behalf of UCRRA with their own existing and well-trained work force. It is also possible that the towns or any of them will transfer their employees to UCRRA. UCRRA would then be directly responsible for supervision and administration of the employees. Under the preferred method, the employees would remain employees of the town and UCRRA would contract with the town for the service of operating the landfill. That service would be under the program supervision and control of UCRRA's landfill operations manager. Administrative control over the employees would remain with the town government.

The existing equipment utilized at the landfill would also be sold or leased to UCRRA for use in landfill operation. Any additional equipment required would be purchased by UCRRA pursuant to its bond issue or leased. The town would be responsible for maintenance and upkeep of the equipment and UCRRA would reimburse the town for such costs.

Operations at the landfill would be conducted in accordance with existing Part 360 regulations as embodied in the revised consent order. This will include a provision for a site monitor (a NYSDEC employee paid by UCRRA). The site monitor would transfer between the three consolidation landfill sites and would be responsible for observing operations and insuring compliance with the revised consent order. Presently, there are no NYSDEC monitors at any of the existing landfill sites. The town work force, of course, would also be responsible for reviewing the solid waste to be disposed of at the facility. If any of the three components of the review system - UCRRA's scalehouse operator, the

town employees working the landfills, or the DEC monitor were to detect the disposal of unlawful solid waste, there would be a process for the separation and review of the questionable materials. If the material is to be rejected, it will be loaded on to the disposal vehicle which brought it and will be disposed of at the cost and expense of the hauler at an appropriate facility.

The agreements also call for the establishment of an ad hoc liaison committee between UCRRA and the town to insure that the operations at the facility are in accord with the agreement and the revised consent order.

Operations at the landfill will be restricted to the existing footprint and the operations will cease upon the earlier of the following events:

1. Achievement of capacity of the existing footprint under 6 NYCRR Part 360 rules and regulations;

2. Commencement of operations at the County-wide 6 NYCRR Part 360 landfill;

3. Expiration of UCRRA's authority to operate under the revised Consent Order; or

4. January 1, 1996.

The closure and monitoring of the consolidation landfill will be the responsibility of UCRRA. The costs of paying for closure will be generated through the tipping fee at the facility and will be placed in a trust account for that purpose. UCRRA's ongoing monitoring obligations will survive the termination of the agreement. A key environmental benefit is that UCRRA will have available to it substantial resources to effect closure of the landfill and that closure will be undertaken pursuant to the revised Part 360 regulations. This will result in a more environmentally protective closure of the facility.

If during the Interim Period the Consolidation Landfills cannot be used for any unforeseen purpose, or UCRRA is unable to commence operations at its 6 NYCRR Part 360 County-wide landfill, then UCRRA could implement disposal of solid waste at other existing facilities outside of Ulster County. UCRRA has reviewed several alternatives as part of the Interim Program. The out-of-County alternative (long-haul) of Ulster County's solid waste is not an accepted practice and has been rejected for the long-term. It is the clear policy of UCRRA and the County to be responsible for the solid waste generated within its planning unit. However, long-haul arrangements can be entered into if System implementation is interrupted or delayed. The following specific facilities have been determined to be available for the possible receipt of solid waste as alternative sites:

1. Al Turi Landfill in Orange County, New York.

Al Turi officials have indicated a willingness to discuss the use of that landfill by UCRRA on a short-term basis. That facility is scheduled to close within the next several years, although an expansion plan has been proposed and currently is under review by DEC. Also, the facility is currently being used by Orange County as an alternative disposal site while problems at its county landfill is being resolved.

2. New Milford Landfill.

This Waste Management facility in New Milford, Connecticut has capacity and is potentially available for use as an alternative disposal site.

3. Earthwatch Contract.

Earthwatch is a private corporation which is responsible for marketing space at an upstate landfill in Chautauqua County. The Chautauqua landfill has existing disposal capacity and has stated willingness, through Earthwatch, to enter into agreements with communities for disposal of excess solid waste. An agreement could be negotiated with Earthwatch for the transportation and disposal of solid waste at the Chautauqua county landfill.

4. Warren-Washington Resource Recovery Facility in Hudson Falls, New York.

This facility is now operational and has additional capacity. The operators of the facility have been in contact with UCRRA concerning the possible of solid waste at this facility. The costs of haul and disposal would be subject to negotiation.

5. Empire Landfill.

This large landfill is in Pennsylvania. The operators of this landfill have indicated a willingness to receive solid waste from New York State communities. Indeed, Oneida-Herkimer Solid Waste Management Authority transports a portion of the solid waste stream from its service area to Empire under a long-term agreement. Empire Landfill would be considered as a potential alternative disposal site, if necessary.

UCRRA will not seek actively, at this time, to transport and dispose of solid waste outside of the planning unit. This is not in keeping with the policy determinations made previously and set forth in the existing SWMP. It is less expensive and more environmentally sound for UCRRA to implement the interim program utilizing the Consolidation Landfills. The interim program allows for the creation of the LCAP which will provide funds to some of

the communities for closure of the existing landfills and will provide for the more environmentally sound closure of the consolidation landfills. The cost of operating a system utilizing the interim program will be less than sending the solid waste to other parts of the State.

However, if required under extreme circumstances, UCRRA could implement one of these alternative disposal options. All that would be required would be a designation of a location in the County for receipt of the solid waste and transfer of the solid waste into long-haul transfer vehicles. There are several permitted locations which could potentially be available for that service, including the City of Kingston transfer station. UCRRA likewise could implement a transfer station at one or all of the three landfill consolidation sites.

Another alternative is the short-term use of landfill reclamation technology. This technology has been determined by UCRRA to be in the development stages and not acceptable for long-term use. However, it is possible that developments in the technology could make it a viable short-term alternative if one of the Consolidation Landfill towns agree. Reclamation is reviewed in the LCP.

Revised Consent Order

UCRRA will not be able to lease the Consolidation Landfills unless and until NYSDEC issues a revised consent order authorizing it to assume responsibility for these landfills and placing on UCRRA the obligation to operate, close and monitor them.

The revised consent orders constitute an enforcement action by NYSDEC. Since NYSDEC would be acting within its enforcement authority, the issuance of the revised consent orders would be in NYSDEC's prosecutorial discretion and would not be subject to review pursuant to SEQRA. Therefore, review of the specifics of the revised consent orders is beyond the scope of this environmental assessment form. However, a proposed revised consent order is attached hereto for informational purposes as Attachment "D". This proposed revised consent order has not yet been put into final form and will be negotiated with NYSDEC, the Towns and UCRRA. Successful completion of those negotiations, approval by all parties and issuance of the Final Revised Consent Order by NYSDEC is a condition precedent to the solid waste management agreements.

Landfill Closure Assistance Plan

The LCAP is described in the LCP. The purpose of LCAP is to provide financial and technical assistance to the non-Consolidation Landfill communities to close their landfills.

Funds and services would become available after UCRRA has issued its revenue bonds. These funds would augment local and state monies available for closure. UCRRA has determined it is feasible to borrow up to $6.5 million for this purpose. Funds and services will be allocated to the municipalities under a formula to be approved by the County Legislature.

UCRRA knows of no other similar program in New York State. While it is recognized that LCAP will not cover all costs of closure, LCAP will shift a portion of the burden for closure costs from the individual municipality's taxpayers to all of the users of the System. This lessens the direct financial impact on the municipality's taxpayers in consideration of the municipality signing the solid waste management agreement.

UCRRA can begin operating the Consolidation Landfills prior to issuing bonds by utilizing existing funds and tipping fee revenues to finance initial operation costs and payments to the landfill closure escrow accounts. However, no funds would be available for SAC construction, County reimbursement or LCAP until revenue bonds were issued.

6. Financing Plan

UCRRA has developed a financing plan pursuant to which it would issue a first series of revenue bonds to finance the interim program as well as the first two phases of its solid waste management system. A draft of the latest available financing analysis shows the specifics of the first series of revenue bonds as well as a projection of the second series which would be issued to finance the construction of the first cell of the County-wide Part 360 landfill. Use of revenue bonds and credit support agreements was studied by UCRRA in the GEIS and findings were issued thereon. Revenue bonds are paid principally by user fees. Therefore, it is important that sufficient solid waste be brought into the System. Therefore, the flow control aspects of Local Laws No. 8 and No. 9 are important.

However, by entering into the solid waste management agreements (and the County Solid Waste Service Agreement), UCRRA will by contract be providing for a sufficient amount of solid waste and recyclables to support the System. This approach provides an added assurance that the long-term project will be feasible for financing purposes, even if the flow control laws are challenged in court.

Discussion of Effects

Effects of the Action Regarding UCRRA

The potential effects of this Action on UCRRA are minimal. The responsibilities of the UCRRA will be increased in

that it will begin providing solid waste management disposal service by becoming responsible for the operation of the Consolidation Landfills prior to the originally envisioned implementation of the new 6 NYCRR Part 360 landfill. The UCRRA will finance operations by charging a tipping fee at the Consolidation Landfills. The tipping fee will be established in an amount to be sufficient to cover the operating expense, closure and compliance costs, debt service payments, administrative costs and professional services costs of UCRRA during the interim period. Operations at the Consolidation Landfills will be provided by existing Town or by UCRRA employees. UCRRA staff may have to be increased to provide for increased transportation of solid waste from the rural transfer stations to the Consolidation Landfills, for inspection and weighing of solid waste at the Consolidation Landfills, and for the accounting function. Alternatively, UCRRA would continue to contract for the transportation services through the County Department of Public Works and contract with the Towns for operation of the Consolidation Landfills.

UCRRA will also have to retain professional engineering services to assist in designing and implementing the Consolidation Landfills operating and closure plans.

The issues involved in the Action would have to be addressed in connection with the siting, design, development, construction, operation and closure of the 6 NYCRR Part 360 County-wide landfill. Therefore, the only impact of the Action on UCRRA is that staff and services may have to be added sooner rather than later. Again, costs will be met by revenues charged for use of the Consolidation Landfills.

Effects Regarding the County as a Whole

The residents of the County will benefit from the modifications. UCRRA's immediate involvement in solid waste management will allow for a coordinated, orderly closure of the existing municipal landfills by providing ongoing disposal capacity at the Consolidation Landfills. UCRRA will agree, under the solid waste management agreements, that solid waste from all of the municipalities will have a home during the interim period. Thus, no municipality will be required to haul solid waste out of the County as some towns are presently doing (at costs greater than UCRRA's system). Nor will Towns engage in bidding wars with each other over accepting neighboring communities' solid waste. NYSDEC and the County Health Department will not be required to mediate disputes amongst municipalities during the interim period.

There will be an organized, coordinated transition whereby the existing landfills will close pursuant to a schedule approved by NYSDEC pursuant to its enforcement authority. The landfills with the biggest environmental capacity and siting problems will be closed first. Solid waste will be directed from

the municipalities to the most accessible Consolidation Landfills. Because there are three Consolidation Landfills, the transportation impacts at each site will be kept to a minimum. Only licensed private haulers or the Agency's transfer vehicles will use the Consolidation Landfills.

Finally, the implementation of the SWMP will be expedited and facilitated as UCRRA will be better situated to issue revenue bonds to finance the actions required by the SWMP including the permanent SAC program and the County-wide 6 NYCRR Part 360 landfill.

Effects on the Consolidation Landfill Communities

The greatest potential effect will be the increase in solid waste being brought to the Consolidation Landfills. As discussed in the LCP, the amount of solid waste to be delivered to the Consolidation Landfills is within the capacity of the Consolidation Landfills. Only the existing footprint will be used, and the height of the landfill cannot exceed 6 NYCRR Part 360 requirements.

The increase in the amount of solid waste is also mitigated by the following factors:

- solid waste will be brought to the Consolidation Landfills only by licensed private haulers (regulated by the Ulster County Department of Health and UCRRA), UCRRA's transfer vehicles or a municipality's vehicles.

- the impact of the increase will be shared by the three Consolidation Landfills.

- the Agency will designate which communities' solid waste will be taken to which landfill, and along with the Department of Health will regulate and inspect haulers, designate which routes are to be used, and will oversee the safety inspection of each vehicle.

Because of the above, increase in truck traffic at each site will be limited to 5-15 additional trips per day. Access is over State roads.

The Action will have a favorable effect on the environment of the Consolidation Landfills towns because the Consolidation Landfills will now be closed in accordance with stricter 6 NYCRR Part 360 closure requirements and UCRRA will be required to observe 6 NYCRR Part 360 operating requirements, such as the development of operating and contingency plans daily cover of solid waste, leachate control, etc. This is not being done in

all instances now. Operation of the Consolidation Landfill will be closely monitored. First, the County Health Department and UCRRA will regulate all users of the Consolidation Landfills. This includes vehicle inspection, facility and route inspections and access to client data. Only designated haulers will be able to use the Consolidation Landfills. Access will be regulated by UCRRA through a gate and all waste will be weighed by computerized scales. Visual inspection of the disposal vehicle and, to some extent, the load of solid waste will be made at the scale. Solid waste will be dumped on the landfill and inspected by the operating employees before the collection vehicle leaves the site. If problems are detected, UCRRA, Town and NYSDEC monitor will be notified. If the solid waste is rejected, the company responsible for bringing the waste to the site will provide for or pay the costs of proper disposal.

The NYSDEC monitor referred to above is required by the revised consent order and will be a NYSDEC employee whose cost will be paid by UCRRA. The monitor's only assignment will be the oversight of operations at each Consolidation Landfill.

Thus, operations at the Consolidation Landfills will be more closely supervised than at present and will be subject to stricter requirements under the revised consent orders.

Closure of the Consolidation Landfills will also be subject to stricter requirements. Therefore, the long-term environmental effect of UCRRA's use of the Consolidation Landfill should be beneficial.

If UCRRA did not become involved, the Consolidation Landfills (and the other municipal landfills) would still be closed by NYSDEC under the existing consent orders. The requirements for closure would not be as strict, no NYSDEC site monitor would be provided nor would there be close scrutiny of landfill operations.

The financial impact of UCRRA's involvement is also beneficial to the Consolidation Landfill towns. Under the LCP, the revised consent orders and the solid waste management agreements, UCRRA will assume the burden of paying for the cost of operation and closure of the Consolidation Landfills. The estimates of closure and monitoring costs range from $1 million to $6 million. UCRRA will fund such costs through the tipping fee. UCRRA will also pay to the Consolidation Landfill communities a host community fee of $1.00 per ton of solid waste disposed of at the landfill for Town purposes and $.25 per ton for fire protection purposes.

The towns have been collecting a tipping fee at the existing landfills and are charging a fee to residents who use them. Costs for operating the landfills are provided in municipal budgets.

The Towns would not be able to continue landfill operations indefinitely. NYSDEC has advised the Towns that each of the landfills in the County will be closed within 1 year to 18 months. Gates to the landfills may be closed even sooner. No Town presently is seeking an upgrade of the landfill and a 6 NYCRR Part 360 permit.

The cost impact of UCRRA's takeover of the Consolidation Landfills will be beneficial in that it will relieve the Town government of the landfill operations cost and, more significantly, the closure costs. Additionally, the host community's fee will be paid. The Towns would lose a portion of the short-term revenues they would collect from users of the landfills, although they can continue to collect fees from their residents who use the rural transfer station. A portion of these fees would go to pay UCRRA for disposing of solid waste generated by Town residents.

UCRRA will also provide, as part of the modified SWMP and under the Solid Waste Management Agreement, funds to upgrade or establish a rural transfer station at the existing municipal drop-off center site. This will ensure that Town residents will continue to have the right to self-haul solid waste. UCRRA will pay up to $40,000 for such upgrading at each municipality and will obtain all necessary NYSDEC permits on behalf of the municipality.

The tipping fee to be charged by the Agency for using the Consolidation Landfills cannot be guaranteed, but based on the most current financial analysis (see, Attachment "E"), the initial fee during the interim period would be under $50.00 per ton. This cost is competitive with other available alternatives for the Interim Period.

Effects Related to the Non-Landfill Consolidation Communities

The effects on the other communities would also be beneficial. By providing funds under the Landfill Closure Assistance Program ("LCAP"), UCRRA would provide direct financial assistance for the closure of the non-consolidation landfills. While the amount of money that can feasibly be raised for this purpose is only a portion of the total cost, no other agency or county in the State has committed to a similar program. Under LCAP, a portion of the financial exposure for closing the Non-Consolidation Landfills is reallocated from the taxpayers of the community to the users of the UCRRA's System. There is no requirement for this initiative. NYSDEC is the only other possible source of funding. Only one municipality (Hurley) has availed itself of this program of 50% reimbursement.

Furthermore, the non-consolidation landfill communities and communities where no landfills exist will benefit from UCRRA's assistance in developing the rural transfer stations described above. Costs of disposal for solid waste in UCRRA's System are

lower than any other alternative available after the non-complying landfills are closed by NYSDEC. Transportation costs are mitigated by the strategic location of the Consolidation Landfills. Finally, each community will benefit from having a waste disposal alternative within the County, avoiding the uncertainty of the availability and cost of out-of-county alternatives.

SEQRA Analysis

The Action involves modification of the SWMP, approval of certain actions to implement the modification, and the exercise of NYSDEC enforcement authority.

The Action, to the extent not the exercise of NYSDEC enforcement authority as analyzed under the criteria set forth in 6 NYCRR 617.11, will not have a significant effect on the environment. Specifically:

1. The Action will not result in any substantial adverse change in existing air quality, ground or surface water quality or quantity, traffic or noise levels. Nor will there be an increase in the potential for soil erosion, flooding, leaching or drainage problems. The Action will improve ground water quality and surface water quality in that the Consolidation Landfills will be operated and closed under stricter 6 NYCRR Part 360 standards and closure of the other existing non-complying solid waste landfills in the County will be coordinated, occur sooner under the action and will benefit from funds in the LCAP. There will be no substantial increase in solid waste production (in fact a decrease is expected due to recycling) and teh increase in truck traffic at the Consolidation Landfills will be minimal, in the range of 5-15 additional truck trips per day.

2. The Action will not result in the removal or destruction of large quantities of vegetation or fauna; substantial interference with the movement of any resident or migratory fish or wildlife species; impacts on a significant habitat area; substantial adverse effects on a threatened or endangered species of animal or plant, or the habitat of such a species; or other significant adverse effects to natural resources.

3. The Action will not encourage or attract a large number of people to a place or places for more than a few days, compared to the number of people who would come to such place absent the Action.

4. The Action will not result in the creation of a material conflict with a community's current plans or goals as officially approved or adopted. Actually, it will help facilitate and expedite the implementation of the goals set forth in the SWMP.

5. The Action will not result in the impairment of the character or quality of important historical, archeological, architectural, or aesthetic resources or of existing community or neighborhood character.

6. The Action will not result in a major change in the use of either the quantity or type of energy.

7. The Action will not create a hazard to human health. It will instead protect human health by providing for the coordinated closure of non-complying landfills and the closing of Consolidation Landfills under stricter standards.

8. There will be no substantial change in the use, or intensity of use, of land including agricultural, open space or recreational resources, or in its capacity to support existing uses. Existing footprints of existing landfills will be used only up to their capacity. The increased amount of waste to be disposed of at the Consolidation Landfills beyond that originally planned will be disposed of in accordance with the stricter operating and closure requirements of 6 NYCRR Part 360.

9. The Action will not result in the creation of a material demand for other actions which would result in one of the above consequences.

10. There will not be changes in two or more elements of the environment, no one of which has a significant effect on the environment, but when considered together result in a substantial adverse impact on the environment.

11. Finally, there are not two or more related actions undertaken, funded or approved by an agency, none of which has or would have a significant effect on the environment, but when considered cumulatively, would meet one or more of the criteria in this section.

Attachment A.

ULSTER COUNTY LANDFILL

CONSOLIDATION PLAN

May 4, 1992

ULSTER COUNTY RESOURCE RECOVERY AGENCY
SEAL OF ULSTER COUNTY
STATE OF NEW YORK
1987

ULSTER COUNTY LANDFILL

CONSOLIDATION PLAN

Submitted To:

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ULSTER COUNTY LANDFILL CONSOLIDATION PLAN

Table of Contents

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

LIST OF TABLES

LIST OF FIGURES

TABLE OF CONTENTS (con't)

APPENDICES

LANDFILL CONSOLIDATION PLAN

I. INTRODUCTION

A. Solid Waste Management Plan (SWMP)

The development of a solid waste management plan (SWMP) for Ulster County (the "County") is mandated by the New York State Solid Waste Management Act of 1988. It is subject to the New York State Environmental Quality Review Act ("SEQRA") process and to regulations set forth in 6 NYCRR Part 360, Section 15, promulgated and administered by the New York State Department of Environmental Conservation ("NYSDEC").

The Ulster County Resource Recovery Agency ("Agency") was authorized by Title 13-G of the Public Authorities Law, Chapter 936 of the Laws of 1988 as a public benefit corporation of the State of New York. Under the Act, the Agency is authorized, among other things, to plan for, design, construct, and equip facilities for the processing and disposal of solid waste and for the recovery and marketing of recyclable materials. Pursuant to 6 NYCRR 360-15, the Agency has been designated as the planning unit for the County and authorized it to develop the SWMP and conduct the SEQRA review.

Accordingly, the Agency prepared the SWMP in the form of a Generic Environmental Impact Statement ("GEIS") and conducted the SEQRA review. At the conclusion of this review, the Agency approved the Plan as a Final GEIS and issued a Findings Statement in September 1990. On October 31, 1990, the SWMP was submitted to NYSDEC in draft form. Comments were provided to the Agency on December 27, 1990, to which the Agency responded. The Plan was approved by County Legislature in May 1991 and presented to NYSDEC on October 30, 1991 for final review and approval. On December 3, 1991, the NYSDEC issued a SEQRA Findings Statement which approved the SWMP. A copy of the approval letter and Findings Statement are included in Appendix A (item A-1) for further reference.

B. ELEMENTS OF THE APPROVED SOLID WASTE MANAGEMENT PLAN

In accordance with the New York State policy, Ulster County's approved SWMP is based on the planning hierarchy established in the ECL and designates waste reduction and

recycling as the cornerstone of the County's planning policy. The Plan covers a 25-year planning period from 1989 to 2014 and contemplates maximizing recycling, reuse, and reduction to the greatest extent technically possible. The Plan includes a 5-year interim period from 1989 to 1994 as necessary for the planning, design, siting, and construction of the various solid waste management facilities called for.

The Plan's major program components are fully described in Chapter 9.0 of the Solid Waste Management Plan, but are summarized here as follows:

- Waste reduction and reuse through legislation and education;

- A Household Hazardous Waste (HHW) control program that provides for the construction of a permanent facility to receive, process, and prepare for safe disposal of all HHW generated in the County;

- A recycling program based on Municipal Recycling Drop-off Sites (MRDS) in each of the County's municipalities, Satellite Aggregation Centers (SACs) at which specified recyclables are received from the MRDS and combined for more economical shipment to markets, and a transportation system operated by the Agency for collecting recyclables at the MRDS and transporting them to the SACs and then to market;

- Continued private recycling of commercial recyclable material now being recovered and recycled by the private sector;

- A Municipal Organic Waste Composting and Diversion Program which includes a facility for composting municipal organic waste, including leaves, grass clippings, and yard waste not handled through backyard compost operations, certain food wastes from commercial establishments, and dewatered sewage sludge from municipal sewage treatment plants;

- A volume reduction and recycling program for the management of construction and demolition (C&D) waste which involves offering the private sector an opportunity to construct and operate a Countywide C&D facility, and if necessary, provision of such a facility by the Agency;

- The siting and development of a single landfill within the County as the means for the disposal of wastes that cannot be reduced, recycled, or used in the compost operations. This landfill is estimated to receive about 50% of the solid waste generated in the County over the 25-year planning period.

Since siting and construction of a Part-360 landfill is expected in 1996 and since the local landfills now operating under Orders on Consent are slated to close by the end of 1993, there will be a period when local landfills have been closed and the new Countywide landfill may not yet be available. During this period, which is estimated to last from 1993 to 1996, the Agency is proposing this interim Landfill Consolidation Plan (LCP) as a means for an orderly transition while still providing disposal capacity for Ulster County residents. To do this requires that the Agency modify the approved SWMP.

C. Solid Waste Management Plan Modification

In the letter transmitting the SWMP approval to the Agency, NYSDEC noted that any modifications of the plan must be submitted to NYSDEC for approval under 6 NYCRR Section 360-15.11. Although the SWMP makes reference to the possible need for interim measures between the closure of existing landfills and the development of a new Part 360 Countywide landfill, the Landfill Consolidation Plan (LCP) as described in this document was not specifically called for in the approved SWMP. NYSDEC has therefore determined that prior to implementing a Landfill Consolidation Plan, a "Request for Modification" of the approved SWMP would be needed and that all modifications should be made pursuant to Section 360-15.11 (Modification of DEC approved SWMPs) guidelines. Further, NYSDEC indicated that any Plan modifications be fully described, the expected benefits discussed, and that they be supported by adequate information to justify the change. A copy of the NYSDEC January 8, 1992 letter outlining the Department's position with respect to Plan modifications is included in Appendix A (item A-2) for further reference.

The language changes which would modify the SWMP to include a Landfill Consolidation Plan can be found in the Environmental Assessment Form - Interim Solid Waste Management Program, Exhibit 1, Attachment B dated May 4, 1992. This LCP document provides the supporting data to justify the proposed Plan modification.

D. Landfill Consolidation Plan (LCP)

Under the Landfill Consolidation Plan (LCP), the UCRRA would become involved in the day to day management of all of the County's solid waste. The LCP calls for UCRRA to lease and operate three of the County's fifteen existing municipal landfills during an interim period 1992-1995, while simultaneously siting and permitting the new Countywide landfill. The LCP also provides for the coordinated closure of the twelve remaining municipal landfills, pursuant to consent order conditions and a schedule approved by NYSDEC.

The NYSDEC's first official response to the Agency's Landfill Consolidation proposal came in a letter dated November 4, 1991. At that time, NYSDEC supported the Landfill Consolidation concept and requested further justification for selection of the Consolidation Sites including: the screening methodology used; clarification of needed landfill capacity for the interim period, and an assessment of operational procedures to be used at each site. A copy of the NYSDEC November 4, 1991 letter is included in Appendix A (item A-3).

In addition, the LCP must meet the criteria set forth in NYSDEC Commissioner Jorling's enforcement directive as amended 12/12/88. The data presented in this document addresses questions raised by NYSDEC Region III and all matters contained in the Commissioner's Enforcement Directive.

II. IMPLEMENTING THE LANDFILL CONSOLIDATION PLAN

A. Actions Undertaken

To assist the Agency in implementing both the approved SWMP and the LCP, several key actions have been undertaken. These include:

- Adoption by the County Legislature of a **Mandatory Source Separation and Recycling Law** which requires that residents, businesses, institutions, and local governments separate certain regulated recyclable materials from the waste stream. (Adopted 12/31/91)

- Adoption by the County Legislature of a **Solid Waste Management Law** (Flow Control Law) giving the Agency the authority to direct all solid waste including regulated recyclable materials to specific facilities for processing and/or disposal (Adopted 12/31/91)

- Approval of a **Service Agreement** between the Agency and the County that designates the Agency as being responsible for the management of the County's solid waste in accordance with the SWMP until March 1, 2017. (Approved by County Legislature 12/31/92)

- Approval of **Solid Waste Management Agreements** between the Agency and Ulster County municipalities which ensures a coordinated transition of responsibility for Solid Waste management from the municipalities to the Agency and under which the Agency agrees to provide Solid Waste management services to the municipalities for the term of the agreements, 1992 through March 1, 2017. (Agreements under negotiation)

- Approval by NYSDEC of **Plan Modifications to the SWMP** to include a Landfill Consolidation Plan as described in this document. Plan Modification approval follows the procedures outlined in 6 NYCRR P360-15. (Under consideration)

- Approval by NYSDEC of the Agency's proposed **Landfill Consolidation Plan.** (Under consideration)

- Approval and issuance by NYSDEC of **Consent Orders regarding the Consolidation Landfills.** (Under consideration)

- Adoption by the Agency of a **Financing Plan and Issuance of Revenue Bonds** to finance the SWMP and LCP. (Under development)

Upon approving its Financing Plan, taking over the Consolidation Landfills and issuing its first series of revenue bonds, the Agency will assume its function of providing solid waste management service for the County in accordance with the provision contained in the County/Agency Service Agreement. Proceeds from the sale of bonds will be used for capital projects necessary to implement the solid waste management system. This includes:

- Constructing and equipping a **Satellite Aggregation Center (SAC) System** for transporting, processing, and marketing the County's regulated recyclable materials;

- Constructing and equipping a system of **Rural Transfer Stations** for collecting and transporting solid waste and regulated recyclable material to the Consolidation Landfills and SAC(s);

- Siting and permitting **a Countywide landfill** meeting the requirements of 6 NYCRR Part-360;

- Constructing and permitting a **Permanent Household Hazardous Waste Collection Facility;**

- Design and development of a **Municipal Organic Waste Composting Facility;**

- Developing a **Construction & Demolition Debris and Waste Tire Recycling/Disposal Program;**

- Implementing the **Landfill Consolidation Plan** which includes providing direct financial assistance to towns for closing existing landfills and for upgrading three consolidation landfills;

- **Reimbursing the County** certain funds advanced to the Agency for planning, siting studies, and recycling program development.

Monies for operating the Consolidation Landfills, the long term solid waste management system, and for repayment of debt service on the bonds will come primarily from tipping fees at the consolidation landfills, and the new Part 360 landfill when constructed.

B. Costs of Implementing SWMP and LCP

The Agency intends to use the proceeds from the 1992 General Revenue Bond issue to finance programs called for under the SWMP and the LCP, to provide financial assistance to municipalities required to close their present landfills, and to reimburse the County for certain activities. Below is a Bond Size summary depicting the allocation of proceeds of the 1992 bond issue. Additional details regarding the Bond Size can be found in the EAF, Exhibit 1, Attachment E (Dated 5/04/92).

1992 BOND SIZE SUMMARY

	Capital Costs
SAC Construction and Equipment.....	$2,000,000
Rural Transfer Stations.....	800,000
Consolidation Landfill Upgrades.....	1,000,000
Siting/Permitting New Countywide Landfill.....	2,500,000
C&D/Tire Mgmt/Compost Facility Dev.....	500,000
Household Hazardous Waste Facility	500,000
Closure of Existing Landfills.....	6,500,000
County Reimbursement.....	6,200,000
Total Capital Costs.....	20,000,000
Net Capitalized Interest.....	1,479,000
Debt Service Reserve Fund.....	2,470,000
Bond Discount & Issuer's Expense.	741,000
Total Bond Size.....	**$24,690,000**

C. Status of Existing Municipal Landfills

Currently there are 15 municipally owned landfills operating in the County. (See Figure 1. Landfill location map) Table 1. summarizes the principal characteristics of these landfills. (A complete description of existing solid waste disposal practices can be found in Chapter 2.0 of the SWMP.) Since all of the existing landfills were operating before the promulgation of the December 31, 1988, revised Part 360 regulations, they do not have impermeable liners under the footprint, nor do they have leachate collection systems. Under the new regulations, they were not eligible for permit renewals and were faced with two choices, either upgrade to meet the requirements or close. All of them have been allowed to continue to operate under Orders on Consent between the towns and NYSDEC. These orders provide for an orderly closure process under the control of NYSDEC. Towns are required to take several steps towards closure. First, they must prepare a Proposed Subsurface Investigation Plan (PSIP) which describes the number and location of monitoring wells to be drilled. After the PSIP is approved by NYSDEC, wells are installed, testing

conducted, and a Subsurface Investigation Report (SIR) is prepared. From the SIR, a determination can be made on the extent and type of contamination present, and if contravention of groundwater standards has occurred. Following review and approval of the SIR, a closure plan is prepared. After it is approved, actual closure work can begin. Closure usually takes place in two stages: first the "landfill gates are closed" and no further waste is allowed to be received; second, the construction of the capping system and any other aspects associated with the closure process is conducted. NYSDEC has advised the County that it expects to close all landfills other than those used as Consolidation Landfills by the end of 1993. Table 2 outlines the status of the sub-surface investigation for the 15 existing active municipal landfills and one inactive landfill located in the Town of Kingston.

III. REQUEST FOR LANDFILL CONSOLIDATION PLAN APPROVAL

A. Need for Landfill Consolidation Plan (1992-1995)

The Agency has completed a preliminary screening of potential sites for the Countywide landfill under the studies conducted for the Generic Environmental Impact Statement (GEIS) and Supplemental Draft Generic Environmental Impact Statement, Section 2.0, Dated April, 1990.

The Agency is not prepared to make findings as to the recommended site for site specific environmental review and permitting pursuant to 6 NYCRR Part 360 at this time. UCRRA believes that on-site testing must be performed on at least two candidate areas before selection of a preferred site.

Since development of a Countywide landfill is a time consuming process and the date at which such a landfill could become operational is uncertain at this time, there is a need for an interim program to ensure continued availability of disposal capacity for the County while the Countywide landfill development process proceeds. The LCP is designed to meet this need.

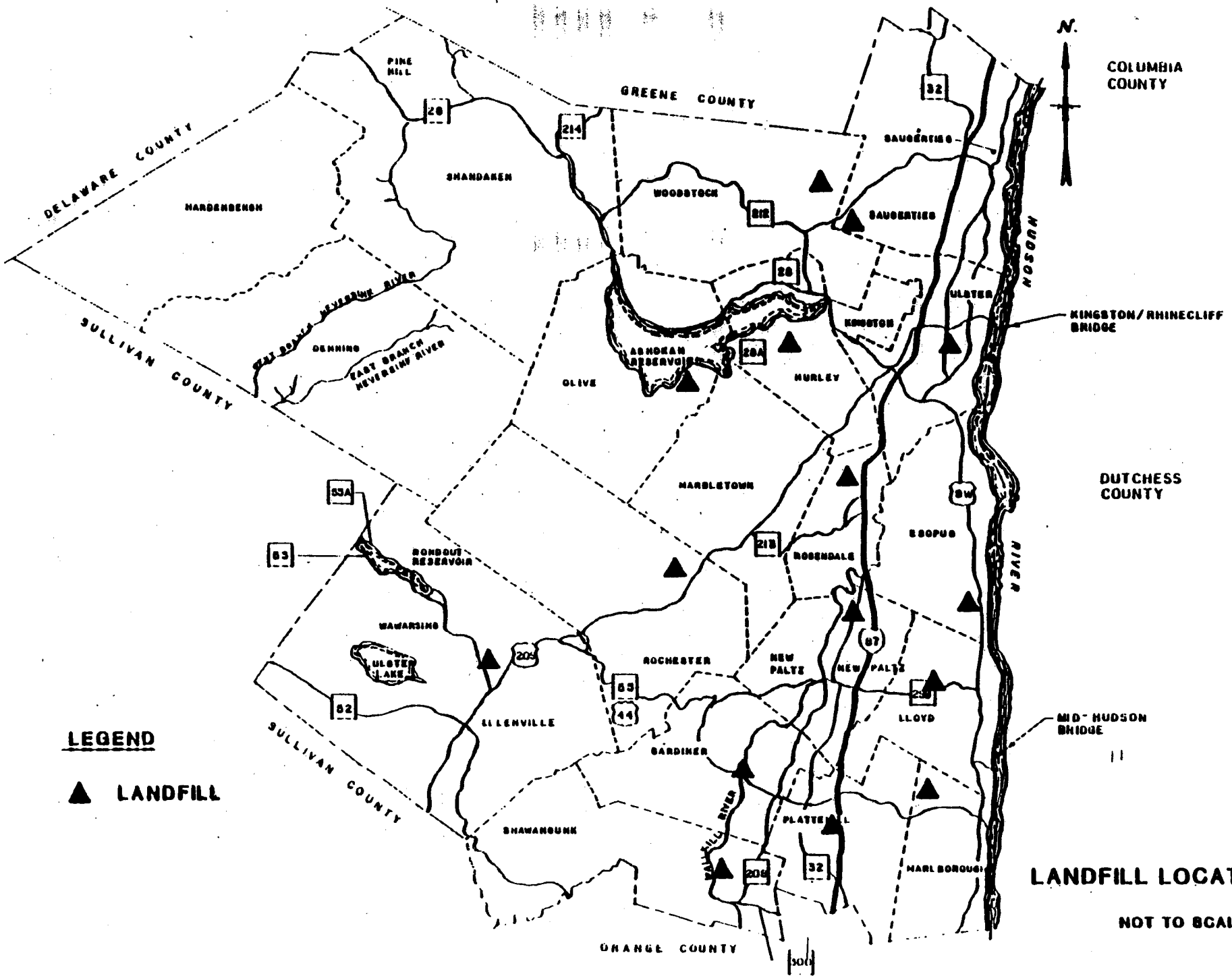


FIGURE 1

LANDFILL LOCATION MA

NOT TO SCALE

TABLE 1.
EXISTING MUNICIPAL LANDFILL SUMMARY

Town	Date of Operation	Site Size Total (acres)	Site Size Footprint(2) (acres)	Types of Waste Accepted (1)
Esopus	1968	35	11	R,C,I,T,O,CD,LY,WG
Gardiner	1951	98	4	R,C,T,CD,LY,WG
Hurley	1940	12	4	R,C,LY,WG
Lloyd	1966	82	7	R,C,I,T,CD,LY,WG
Marlborough	1972	83	4.5	R,C,I,T,CD,S,LY,WG,P
New Paltz	1969	151	20	R,C,I,CD,S,LY,WG,P
Olive	1950	18	7	R,C,CD,LY,WG
Plattekill	1958	40	5	R,C,CD,S,LY,A,WG
Rochester	1974	65	8	R,C,LY,CD,WG
Rosendale	1948	12	3	R,C,I,T,CD,WG
Saugerties	1969	40	11	R,C,I,T,S,CD,LY,WG
Shawangunk	1975	25	5	R,C,I,S,O,CD,LY
Ulster	1955	46	23	R,C,I,CD,S,LY
Wawarsing	1974	60	16	R,C,I,T,S,CD,WG
Woodstock	1968	76	18	R,C,T,CD,LY,P,WG,A

Notes: (1) Key to Waste Types:

A Automobiles	O Offal	G Glass
C Commercial	P Pomace	M Metals
CD Construction & Demolition Debris	R Residential	N Newspaper
I Industrial	S Sewage Sludge	
LY Leaf & Yard Waste	T Tires	
	WG White Goods	

(2) Footprint size based on review of municipalities' subsurface investigation reports (SIRs), or estimates from other studies.

TABLE 2
NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
REGION III/SOLID WASTE
STATUS OF SUBSURFACE INVESTIGATIONS

Name of Facility	PSIP Submitted	Comments on PSIP	Revised PSIP Submitted	Comments on Revised PSIP	PSIP Approved	SIR Due	SIR Submitted	Comments on SIR	SIR Supplement Submitted	SIR Approved	Current Status Comments
Esopus	12/08/87	4/26/90	7/05/90	8/28/90	8/28/90	3/26/91	11/19/91				under review
Gardiner	8/31/89	4/16/90	10/22/90	11/19/90	11/19/90	5/17/91	1/20/92				SIR under review
Hurley	4/08/91	4/30/91	--	--	--	10/28/91	7/01/91	8/01/91	10/18/91	10/3[illegible]/9[illegible]	Subl.Data Req. Closure Plan Under Review
Lloyd	11/17/88	5/12/89	8/10/89	9/01/89	9/01/89	3/01/90	5/16/90	6/15/90	--	[illegible]/15/90	Closure Plan Under Review
Marlborough	5/16/88	9/06/90	10/11/90	11/19/90	11/19/90	6/17/91			5/29/92		Drilling complete SIR under review
New Paltz	5/02/88	6/21/89	1/26/90	2/09/90	1/09/90	9/06/90	7/15/91	8/22/91		8/22/91	Closure Plan Under Review
Olive	5/18/88	11/08/91	1/27/92	--	2/07/92	9/04/92					Waiting for SIR
Plattekill	7/26/88	4/05/90	1/31/91	2/25/91	2/25/91	9/23/91	1/15/92				SIR under review
Rochester	2/05/88	11/10/89	1/21/90	7/20/90	7/20/90	2/15/91	11/18/91				SIR under review
Rosendale	12/15/88	12/18/90	5/28/91	7/15/91	12/02/91	6/29/92					Drilling complete Waiting for SIR
Saugerties				PHASE II SITE TESTING .....Site De isted							PSIP to be called in
Shawangunk				CLOSURE ORDER REQUIRED							PSIP to be called in
Ulster	5/20/88	9/20/90	2/28/91	3/06/91	3/06/91	10/02/91	3/05/92	4/08/92			SIR Supplement Required
Wawarsing	6/28/90	10/23/90	11/29/90	12/12/90	12/12/90	7/10/91	3/25/92	5/08/92			SIR deficient Supplement Required
Woodstock	6/27/88	7/19/89	10/13/89	12/21/89	12/21/89	10/19/90	2/11/91	3/18/91	10/28/91		Supl.SIR under review

Source: NYSDEC 2/03/92

B. Landfill Consolidation Plan Objectives

1. Orderly Closure of Existing Landfills - The prime objective of the Landfill Consolidation Plan is to allow for the orderly closure of the fifteen existing landfills while simultaneously providing disposal capacity. All of these landfills are operating under Orders on Consent issued by NYSDEC and accepted by the towns. NYSDEC has indicated that it intends to close all landfills by the end of 1993, except for those that operate as Consolidation Landfills under this Landfill Consolidation Plan. Since the Countywide landfill is not expected to be available to receive wastes until January 1996 closure of all existing landfills would create significant hardships for the towns. In order to minimize these hardships, the Agency has developed this Landfill Consolidation Plan which provides for the Agency to assume operational control of three landfills and direct the wastes from towns whose landfills have been closed to these landfills. The landfills selected as Consolidation Landfills are those that have been screened using certain environmental and capacity criteria (see Section IV.) Based on the NYSDEC review of their Subsurface Investigation Reports (SIR). They have been deemed not to pose any significant or immediate threat to groundwater contamination. The Agency proposes to operate these landfills under new Orders on Consent entered into between the Agency and NYSDEC as part of NYSDEC's concurrence in the Consolidation Plan. At the end of the interim period, the Agency would close these landfills under the terms of the new Orders on Consent provisions. This LCP also provides that both technical and direct financial assistance be given to the towns whose landfills have not been chosen as Consolidation Landfills.

2. Assistance to Municipalities - The Agency has offered both financial and technical assistance to the municipalities for closing landfills under the existing Orders on Consent. This may be done by developing standard specifications for both professional services and closure implementation contracts. The Agency may also act on behalf of towns in entering into such contracts. Standard contracts are expected to result in substantial savings to the town on both professional services and closure contracts.

The Agency will also include in its financial program an allocation of 6.5 million dollars for grants to towns whose landfills are not considered Consolidation Landfills. The exact formula for allocation of these funds will be worked out jointly between the Agency, the

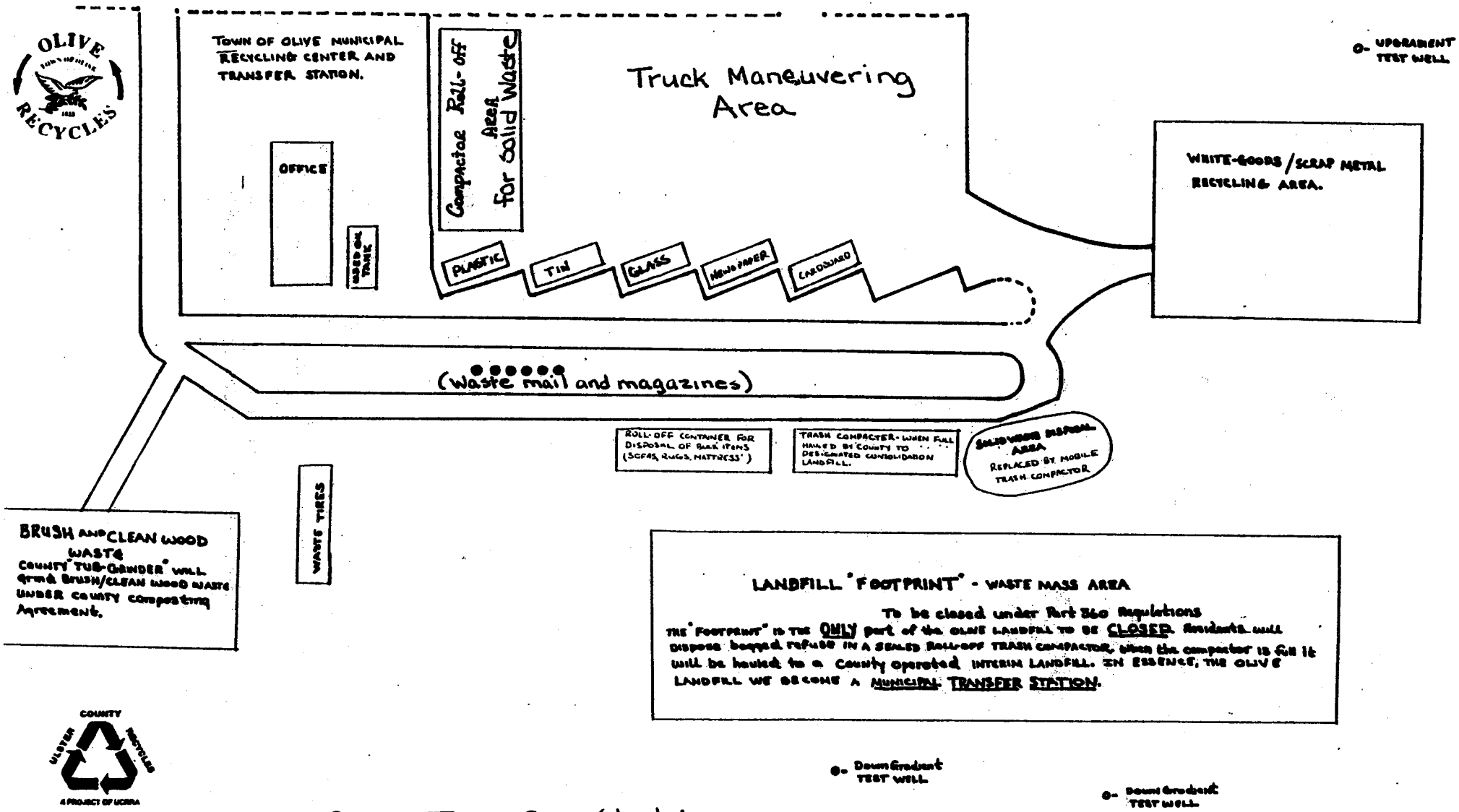
County Legislature, and the Towns. It is anticipated that the formula will take into consideration the estimated cost of closure, size of the footprint, and the population affected by the closure. The average value to each municipality will be about $500,000 per landfill.

In addition, the Agency may enter into Countywide contracts for furnishing materials, such as clay cover necessary for closure. Again, Countywide procurement is expected to lower the costs to each municipality.

3. Minimizing Environmental Impacts - The LCP will minimize environmental impacts at the existing landfills by allowing the coordinated and expeditious closure of those landfills that have shown significant contravention of groundwater standards as documented in the SIR. The LCP will also provide the affected towns with alternate disposal sites while the Countywide landfill is being developed. This plan will minimize traffic related impacts of closure by utilizing Consolidation Landfills in different sectors of the County and directing towns to Consolidation Landfills that will involve a minimum of hauling. (See recommended Consoliation Landfill Transportation Plan, Section V.c)

The revised Order on Consent will also require that the Agency operate and close the Consolidation Landfills in accordance with current 6 NYCRR Part 360 regulations thus providing for a safer and more environmentally sound closure. The landfills, if operated and closed by the towns, would be subject to less stringent controls. Furthermore, a monitoring system will be in place under this plan. First the Agency will monitor all truck traffic at the scale house, only permitted and licensed vehicles will be allowed to use the Consolidation Landfills. Town operating employees will monitor each load on the face of the landfill, and a NYSDEC monitor will inspect each landfill on a daily basis. The NYSDEC monitor will be paid by the Agency and will oversee operations at the three Consolidation Landfills only.

4. Avoiding Hardship During the Interim Period - Without the LCP, towns face approximately two years without a site for disposal of solid waste. This would necessitate hauling solid waste outside the County. The availability of disposal options in the Hudson Valley region is extremely limited and the major private landfill available (Al Turi in Goshen, NY) is itself scheduled to close during this period. The current tipping fee at Al Turi is in the range of $65/ton. When added to transportation costs, this represents a substantial



Rural Transfer Station

Prepared by Chuck Davis, Recycling Coordinator
Town of Olive

Figure 2.

In this manner, the Agency will ensure that an economical and environmentally safe method of waste disposal will be available to County residents during the interim period while the Part 360 Countywide landfill is being developed.

C. Alternatives to Landfill Consolidation Plan

1. No Action

Failure by the Agency to implement the Landfill Consolidation Plan will have the following impacts:

It will create hardships for those municipalities whose landfills are being closed under the existing Orders on Consent by not providing alternate disposal capacity. These landfills will be closed by NYSDEC under a schedule based on completion of subsurface investigations and preparation of closure plans regardless of whether the Agency is providing alternate disposal.

The Agency will not be able to implement the remaining elements of the SWMP for lack of funding. Sale of the revenue bonds is contingent on the Agency's ability to demonstrate that it is performing the service of providing waste disposal to the County. Failure to take any action may be construed by the bond underwriters as inability to provide service.

2. Exporting of Waste

Exporting waste out of the County was considered one of the potential solid waste management approaches in the SWMP (See SWMP, Section 1.3) It was rejected because of its uncertainty and cost. While the Agency could contract for out-of-County disposal during the interim, such disposal would be more costly than proceeding under the Landfill Consolidation Plan. This is based on anassessment of transportation costs and current tipping fees at out-of-County facilities. (See EAF, Exhibit 1. pages 11-13.) Exportation does, however, serve as a potential back-up strategy. Should the Consolidation Landfills became unavailable, the Agency will be prepared to seek and implement out-of-County options if necessary.

3. Landfill Reclamation

Landfill reclamation through mining of existing municipal solid waste (MSW) landfills is an emerging technology being offered by private contractors and being tried by several municipalities in an effort to reclaim previously closed landfill cells be excavation. Saleable materials, including daily landfill cover, may be recovered and landfill life may be extended. Attempts have been made to combine landfill reclamation with MSW composting. This technology was considered in the SWMP,(see Supplemental DGEIS, Section 5.0), but was rejected because it could not qualify as a readily available technology. It is presently considered to be in the research and development stage. Unresolved issues concern the risks involved in the operation, the need for a disposal site for materials that do not have an economic value, and the marketability of those materials that are considered to have an economic value. The technology was deemed to involve environmental and economic risks of sufficient magnitude to conclude that it was not feasible for Ulster County at this time. The same conclusions apply to the use of landfill reclamation for the interim period. However, the Agency will continue to monitor the results of the landfill reclamation demonstration programs undertaken at the Town of Edinburgh landfill in Saratoga County and elsewhere. If favorable results are reported, the Agency will re-evaluate reclamation as a possible back-up strategy.

IV. EVALUATING EXISTING LANDFILLS AS CONSOLIDATION LANDFILLS

A. Consolidation Landfill Screening Methodology

The three landfills to be utilized in the Landfill Consolidation Plan have been selected according to a landfill screening methodology that was developed in consultation with NYSDEC Region III personnel and follows the criteria established in Part 360 and the Commissioner's Enforcement Directive II.14, Closure of Active Solid Waste Landfills dated 1984, revised December 29, 1988. Consultants for the municipalities with existing landfills were also contacted during the screening process. The most important selection criteria according to NYSDEC were the results of groundwater testing reported in the Subsurface Investigation Reports (SIR). The SIR must not reveal any significant contravention of groundwater standards, so that the sites do not constitute an imminent threat to groundwater quality. The second criteria is that the landfill should not be located in an environmentally sensitive area (i.e., wetlands, flood plains, on bedrock, etc.). The third is that the landfills must have sufficient disposal capacity for the interim period. The disposal capacity is defined as the remaining capacity if the existing footprint were allowed to be utilized to the maximum closure slopes permitted under 6 NYCRR Part 360. On this basis, landfills of the Towns of New Paltz, Ulster, and Wawarsing have been selected for use as Consolidation

Landfills. Section IV. B. below describes in detail the Consolidation Landfills site selection process which was conducted in phases. Table 3. shows the initial screening of the 15 existing landfills for available capacity. Table 4. contains the results of the primary environmental criteria screening of the eight existing landfills that survived the initial screening. Table 6. presents a summary of the detailed capacity assessment of six landfills that are potentially suitable as Consolidation Landfills. As an additional reference, Table 1. contains an Existing Municipal Landfill Summary, and Table 2. depicts the Status of Subsurface Investigation at each of the landfills.

B. Consolidation Landfill(s) Site Selection

The site selection process involved four phases:

Phase 1. General Capacity Screening

Phase 2. Primary Environmental Criteria Screening

Phase 3. Secondary Environmental, Operational, and Capacity assessment.

Phase 4. Detailed Capacity Assessment

During each phase of the screening, Agency staff and engineering consultants met with NYSDEC Region III personnel, the Ulster County Department of Health, and the municipal officials and consultants (where applicable) for the purpose of utilizing the best available data. Information contained in each of the Towns' Subsurface Investigation Report (SIR), Closure Plan, and/or earlier landfill studies was analyzed and applied to the site selection process. Base data on each existing landfill was taken from two studies (DGEIS, Volume II, Appendix C. - Ulster County Landfill Profiles and the Supplemental DGEIS, Chapter 4.0, Review of Existing Landfills) prepared by the Agency's consultants in 1988 and 1990 respectively. Additional field investigations and site visits to each of the 15 existing sites was conducted in the Fall of 1991. For a more detailed listing of source data used in the screening process, refer to Appendix B. - References.

Phase 1. General Capacity Screening - During this phase, the size of each landfill footprint was examined to determine if there was enough useful capacity for the interim period (1992-1995). Landfills that had footprints of less than seven acres, were mounded and nearly filled or, were within two years of being filled based on current usage, were considered <u>unsuitable</u> as a Consolidation Landfill and were excluded from the further consideration. In addition, the status of the SIRs (see Table 2.) was assessed and smaller landfills

TABLE 3.
Phase 1. - General Capacity Screening

Municipality	Footprint Acreage	Footprint Condition	Environmental Evaluation	Result
Esopus	11+	flat	SIR under review Closure Plan due	Potential
Gardiner	4	filled	SIR under review	Excluded
Hurley	4	filled	Closure Plan submitted	Excluded
Lloyd	7	flat	Closure Plan submitted	Potential
Marlborough	4.5	[illegible]round	SIR due	Excluded
New Paltz	20	flat	Closure Plan submitted	Potential
Olive	7	filled	SIR due	Excluded
Plattekill	5	filled	SIR under review	Excluded
Rochester	8	flat	SIR under review	Potential
Rosendale	3	filled	SIR due	Excluded
Saugerties	11	flat	SIR due Phase II testing	Potential
[illegible]engunk	5	[illegible]	Sir due [illegible]	Excluded
Ulster	[illegible]	flat	SIR under review	Potential
Wawarsing	16	flat	SIR under review	Potential
Woodstock	18	flat	Supplemental SIR revised Closure Plan due	Potential

which had not yet submitted their SIRs were considered excluded as well. Table 3. depicts the result of the Phase 1. General Capacity Screening. Eight landfills survived this initial screening and were considered as having the potential for being a Consolidation Landfill.

Phase 2. Primary Environmental Criteria Screening - In this phase, the eight landfills having potential for being a Consolidation Landfill were examined for general compliance with the major exclusionary criteria of Part 360-2.12(c), some of the evaluation criteria of Part 360-2.12(d), and the terms of the Orders on Consent with respect to Subsurface Investigation Reports and Closure Plans. Table 4. shows the results of the Phase II screening. The Primary Environmental Criteria used included:

1. **Proximity to Primary or Principle Aquifers** - As defined in Part 360-2.12(c)(1). Sites over primary or principle aquifers or within public water supply well head areas were excluded from further consideration. Sites needing an aquifer determination were considered less favorable.

2. **Proximity to Flood Plains** - As defined in Part 360-2.12(c)(2) and as identified based on a review of FEMA maps. Existing landfills in flood plains must be operated to prevent encroachment of flood waters and must not pose a significant hazard to human life, wildlife, fisheries, or land or water sources. Sites within floodplains were considered unsuitable. Sites adjacent to floodplains were considered less favorable.

3. **Proximity to Airports** - As defined in Part 360-2.12(c)(3). Existing landfills within 5,000-10,000 feet of an airport runway were not excluded, but were considered less favorable because they pose a bird hazard to aircraft.

4. **Proximity to Freshwater Wetlands and Water Bodies** - As reviewed with respect to the NYS Freshwater Wetlands Act for regulated wetlands and Part 360-1.14(b) for water bodies. Solid waste must not be deposited in and must be prevented from entering surface waters or groundwaters. Existing landfill sites which were located in or contained significant portions of wetlands or water bodies meeting the above criteria were excluded from further consideration. Landfills which were adjacent to regulated wetlands or water bodies were considered less favorable, but not excluded.

5. **Proximity to Parks and Preserves** - Existing landfills located within the Catskill Park were considered unsuitable, but not excluded.

6. **Groundwater Contamination** - A major consideration was the extent of groundwater contamination as evidence in the results of the subsurface investigation which had been conducted by the towns as part of the conditions of the Orders on Consent process. Sites which showed significant levels of contamination in excess of NYS groundwater standards were excluded. If the contravention of groundwater was limited to parameters typically associated with natural groundwater in the area, the groundwater impacts were considered acceptable. Sites where reports were not submitted or where additional groundwater testing was required were considered less favorable.

   Hazardous Waste Site - A site listed on NYSDEC's Registry of Inactive Hazardous Waste Disposal Sites in New York State as a Class 2 or Class 2A site was considered a basis for excluding a site from further consideration. A classification of 2 indicates that the site required remediation. A classification of 2A indicated the need for further studies. 2A sites were considered less favorable.

   Down Gradient Receptors - As a worst case scenario, residents, businesses, and public water supply well head areas situated in the projected groundwater flow path from an existing landfill were considered to be potentially impacted by the landfill. The groundwater flow patterns for each landfill were based on the SIRs that were submitted and reviewed by NYSDEC. Comments made by NYSDEC staff regarding these reports and this criteria were considered in the screening process. Landfills with down gradient receptors nearby (within 1000 feet) of the landfill were considered less favorable.

7. **Bedrock Geology** - Old Part 360 regulations required that a minimum vertical separation distance of five feet between the solid waste and bedrock be maintained. The new Part 360-2.13(e) regulations requires that a minimum of ten feet of soil be maintained between the bottom of the landfill and the bedrock below it. An existing landfill that had waste in direct contact with bedrock was excluded from further consideration. A landfill with shallow soil beneath it was considered less favorable.

After applying the above primary environmental screening criteria, six sites (Esopus, Lloyd, New Paltz, Rochester, Ulster, and Wawarsing) had the potential for being considered as Consolidation Landfills. (See Table 4.) Saugerties and Woodstock were excluded from further consideration primarily because the site showed significant groundwater contamination and solid waste was in direct contact with fractured bedrock. The NYSDEC

TABLE 4.
Phase II Primary Environmental Criteria Screening

Town	Aquifer	*Flood Plain	Airport	Wetlands/ Water Bodies	Parks Preserves	**Groundwater Contamination	Depth to Bedrock	Res[illegible]
Esopus	Ruling needed	Adj.	-	Adj.	-	Significant POCs Add't testing DG Receptor	OK	P[illegible]
Lloyd	-	Adj.	-	Adj.	-	Minor DG Receptor	Shallow	[illegible]otential
New Paltz	-	Adj.	-	Adj.	-	Very minor DG Receptor	Shallow in spots	Potential
Rochester	Ruling needed	Adj.	X	Adj.	-	Significant POCs Add't testing DG Receptor	OK	Possible
Saugerties	-	-	-	-	-	Significant Add't testing SIR due 2A delisted DG Receptor	Waste in direct contact w/ fractured bedrock	Excluded
Ulster	-	-	X	Adj.	-	More than minor Add't test[illegible] No DG Receptor	Shallow in spots	Potential
Wawarsing	-	Adj.	-	-	-	Minor Add't testing DG Receptor	OK	Potential
Woodstock	-	-	-	-	Within Catskill Park	Major POCs and metals DG Receptor	Waste in direct contact w/ fractured bedrock	Excluded

* Note: Adj. - Adjacent to
** Note: DG - Down Gradient
***Note: POCs - Principal Organic Contaminants

Health provided technical assistance and recommendations during this phase of the evaluation.

Phase III Secondary Environmental, Operational, and Capacity Assessment - The remaining six sites were subject to a further evaluation based on additional environmental factors, operational and practical considerations, and access to transportation routes. A further review of their Subsurface Investigation Reports (SIRs), and Closure Plans (if available), and the preparation of preliminary estimates of remaining capacity based on full utilization of the existing footprints was conducted. Though none of the sites would be excluded from further consideration, this assessment allowed the Agency to select the top sites for Consolidation Landfills. A summary of the Phase III assessment can be found in Table 5. Each landfill was ranked according to the criteria with either a L (low), M (medium), or H (high). An H (high) rating, means that the site is more favorable for consideration as a Consolidation Landfill. Following is a discussion of the Phase III Assessment:

1. **Aquifer Determination Needed** - Because of the coarse sands and gravel underlying, the Esopus and Rochester sites, NYSDEC indicated that an aquifer determination would be required if these sites were considered as Consolidation landfills.

2. **Additional Groundwater Testing** - NYSDEC has indicated that additional groundwater testing would be required at several sites under consideration. This in itself was not considered sufficient to reject a site. However, the extent and nature of the tests determined whether a site received a L or M ranking. If no further tests were required and groundwater contamination was minor, the site received an H. Only the New Paltz landfill received an H.

3. **Proximity to Water Supplies** - Proximity to either private or public water supply wells was considered in conjunction with the degree of groundwater contamination indicated by the SIRs. The Town of New Paltz site received an H because it had very minor contaminants and private wells are considerable distance from the landfill. The Ulster landfill also received an H rating even though it had minor contamination and additional testing is needed. In this case, the area is served by a municipal water supply system and is fully sewered so that the potential for impacting water supply wells is not a factor.

TABLE 5.

SECONDARY ENVIRONMENTAL, OPERATIONAL, AND CAPACITY ASSESSMENT

Criteria	Existing Landfills					
	Esopus	Lloyd	New Paltz	Rochester	Ulster	Wawarsing
1. Aquifer Determination Needed	L	H	H	L	H	H
2. Additional Groundwater Testing	L	M	H	L	M	M
3. Proximity to Water Supplies	M	M	H	M	H	M
4. Available Disposal Capacity	L	L	M	L	H	H
5. Access and Proximity to Major Transportation Routes	M	M	H	H	H	H
6. Physical Constraints in Operations	H	H	H	H	H	H
7. Availability of Equipment and Personnel	H	M	H	M	H	H
8. Availability of Cover Material	M	M	M	M	M	H
9. Town Participation	H	H	H	H	H	H
10. NYSDEC Recommendation	L	M	H	L	M	H

NOTE: L = low priority as Consolidation Landfill
M = Medium priority as Consolidation Landfill
H = high priority as Consolidation Landfill

4. Available Disposal Capacity - An assessment of the available waste disposal capacity at each site was made (see Section IV. c. - Capacity Assessment and Tables 5. and 6. below) Two sites, Ulster and Wawarsing, received an H rating in that they have considerable capacity for the interim period. None of the sites alone have enough capacity to satisfy the disposal requirements for the interim period.

5. Access and Transportation - In evaluating the potential consolidation sites, the haul distances were considered as an important element to minimize environmental impacts and future operating costs. Sites with access directly off major state highways were given an H, whereas, sites whose access was over town or county roads or through residential areas was rated M or L. Figure 1. - Landfill Location Map, shows the location of various landfills in relation to the highways within the County. Section V.c. and Table 8. describes the recommended Consolidation Landfill Transportation Plan. New Paltz (direct access off Route 32), Rochester (direct access off Route 209), Ulster (direct access off 9W), and Wawarsing (direct access off Route 209), all received a rating of H.

6. Physical Constraints in Operations - A general assessment of each sites, truck maneuvering area, buffer zones, topography, and other aspects associated with operating the landfill was also conducted. None of the sites showed any major physical barriers to operations. All will have to be upgraded to meet Part 360 operating standards. All sites were rated H.

7. Availability of Equipment and Personnel - Sites where there is a full component of equipment and personnel necessary for site operation were rated H. Equipment and personnel requirements are more fully described in Section IV. D. - Preliminary Operations Plan. All of the sites are suited for immediate operations as a Consolidation Landfill. Ulster and Esopus are the only sites with a scalehouse in place.

8. Availability of Cover Material - This assessment included the availability of on-site cover material (preferably clay) for use in daily operation of the facility. Cover material located on-site would reduce operation costs and allow for faster placement, thereby reducing any bird, vector, leachate, or odor problems. Only the Wawarsing landfill has on-site clay for cover material.

9. **Municipal Cooperation** - Each of the six municipalities were contacted to see if they were willing to turn their landfill over to the Agency for use as a Consolidation Landfill. If there had been no interest on the part of the municipality, the Agency would have excluded the site from further consideration. All municipalities were interested and received an H rating.

10. **NYSDEC Recommendation** - NYSDEC was consulted throughout the site evaluation process and their preliminary recommendations as to which sites would be acceptable as a Consolidation Landfill(s) weighed heavily in the Agency's decision. NYSDEC concurred that the Ulster, Wawarsing, New Paltz, and Lloyd sites were all "approvable" as Consolidation Landfills, and that the Esopus and Rochester sites would be considered only if the others were excluded from consideration for some unknown reason. Lloyd, however, because of its small available capacity, was rated M. Ulster, due to more than minor groundwater problems, but having no down gradient receptors, was also rated M.

Based on the Phase III assessment, it was concluded that:

- Four(4) sites are suitable as Consolidation Landfills with two sites, New Paltz and Wawarsing being more environmentally suitable and "approvable" as Consolidation Landfills;

- Some combination of three of these sites would provide the required capacity to handle the estimated quantities of solid waste generated during the interim period;

- A fourth site should be kept in "reserve status" in case the amount of solid waste requiring landfill disposal during the interim period exceeds estimates,or in case unanticipated problems occur at one of the three selected sites.

In order to make a final determination regarding which sites could supply the needed capacity for the interim period, a detailed Capacity Assessment was made. This is described in Phase IV below.

Phase IV Detailed Capacity Assessment - Four sites survived the first three phases of evaluation. The selection of the three sites to be included in the LCP was based on the following analysis of the capacity available at these four remaining sites. This phase of the screening was conducted utilizing solid waste quantity projections, recycling rate projections, and population projections found in Chapter 3.0 and Chapter 9.0 of the Approved Solid Waste Management Plan. Landfill capacity data was obtained from the SIRs, Closure Plans (where applicable), and discussions with the municipality's landfill consultants.

Table 6. - Summary of Interim Disposal Requirements depicts the amount of solid waste that will need to be disposed of during a 5-year period from 1992-1996. In order to ensure that enough landfill capacity will be available, the capacity requirements have been based on 5 years of waste generation (pro-rated for 1992 and 1993) instead of the actual interim program period 1992-1995. It is estimated that 673,400 tons of solid waste could go to the Consolidation Landfills during this time, assuming that planned recycling goals are met.

TABLE 6.
SUMMARY OF
INTERIM DISPOSAL REQUIREMENTS

Year	SW Gen. (tons)	% Recyc.	Am't to be Landfilled (tons)	% to Con. L.F.	Con. L.F. Require. (tons)
1992	254,000	12.5	223,000	25%	56,000
1993	258,000	20.5	205,200	75%	153,900
1994	262,000	37.0	164,600	100%	164,600
1995	266,000	40.5	158,200	100%	158,200
1996	270,000	47.9	140,700	100%	140,700
	1,310,000				663,400

Table 7. summarizes the potential capacity in the six existing landfills that were deemed suitable as Consolidation Landfills. By converting weight into volume, using a compact density of 1,200 lb/cy (machine compacted), an allowance of 25% of the fill volume for intermediate and final cover, a volume of 1,122,350 cubic yards would be needed for disposal of 673,400 tons of waste and an additional 280,587 cubic yards of space would be needed for intermediate and final cover bringing the total capacity needed to 1,402,937 cubic yards.

Table 7. also shows that landfills in New Paltz, Ulster, and Wawarsing together provide in excess of 2,000,000

cubic yards of disposal capacity, if developed to their full potential on the existing footprints. These three landfills will therefore provide sufficient disposal capacity for the interim period.

Since instructions will be issued to private carters as to which sites are to be used for wastes originating from each municipality. (See Transportation Plan, Section V.C) the rates at which each site will be filled can be regulated.

TABLE 7.
SUMMARY OF POTENTIAL CAPACITY
IN EXISTING LANDFILLS
SUITABLE AS CONSOLIDATION LANDFILLS

Landfill	Acres	Elevations		Remaining Capacity (1)	
				Volume (CY)	Tons
Esopus	11	120	150	168,000	76,000
Lloyd	7	100	130	157,000	71,000
New Paltz	20	250	290	578,000	260,000
Rochester	6.5	325	370	174,000	78,000
Ulster	23	260	320	975,000	480,000
Wawarsing	16.5	370	420	703,000	316,000
					1,281,000

Total for New Paltz, Ulster, and Wawarsing 225,600 cy 1,056,000 tons

NOTE (1): 1,200 lb/cy in situ, 25% allowance for cover/closure

V. RECOMMENDED LANDFILL CONSOLIDATION PLAN (LCP)

A. Recommended Consolidation Landfills Sites

Based upon a total review of the siting criteria, a review of available subsurface investigation reports, and the basis of discussion with NYSDEC and the municipalities involved, the Agency proposes that landfills owned by the towns of New Paltz, Ulster, and Wawarsing be used by the Agency in its Landfill Consolidation Plan. These three sites will provide disposal capacity for the entire County until such time that the Countywide landfill conforming to current 6 NYCRR Part 360 regulations becomes available. These landfills were selected in consultation with NYSDEC and on the basis of posing the least potential adverse environmental impacts while being operated during the

interim period. Test results from monitoring wells show no significant contamination of ground water at New Paltz and Wawarsing. Although Ulster showed slight groundwater contamination, there are no public or private water supply wells in the vicinity of the Ulster landfill and the threat to public health is therefore considered minimal.

These three landfills also have sufficient remaining capacity on the existing footprints if developed within the closure guidelines of 6 NYCRR Part 360. The footprint will not be extended beyond areas currently used for landfilling. Finally, these landfills have direct access off of major state highways and are distributed geographically within the County so as to minimize the haul distances from the remaining municipalities. Traffic impacts are anticipated to be minor (See Section V.C.). Ulster will serve the northern sector of the County including Route 9W and Route 28 corridors and the City of Kingston. New Paltz will serve the Route 32/Route 9W corridors, while Wawarsing will serve the Route 209 corridor.

Profiles - Consolidation Landfills

Following is a general discussion outlining the characteristics of each of the three landfills recommended as Consolidation Landfills. Additional data on these sites can be found in Appendix D - Item D-1, Summary of Characteristics of Six Existing Landfills Potentially Useable as Consolidation Landfills. Further detailed information may also be found in the Subsurface Investigation reports for each of the sites (New Paltz, May 1991; Ulster, March 1992; and Wawarsing, March 1992.) These documents may be reviewed at the respective town halls or the NYSDEC Region III office in New Paltz, New York.

1. Town of New Paltz Landfill

The Town of New Paltz landfill is located on a 200 acre parcel of Town-owned property east of Route 32, west of the New York State Thruway, and about three miles north of the Village of New Paltz. (See Figure 3. - Town of New Paltz Landfill Site Location map.) The landfill has been in operation since 1959 and has covered a footprint area of about 20 acres. An additional five acres are used for auxiliary purposes including a recycling center. The surrounding area consists of brush woodlands, streams, and ponds.

Clark Engineers and Associates, the Town's consultant, estimate that about 24,000 cy of household waste and about 12,000 cy of construction and demolition debris are received annually. About 30% of the material is currently being recycled and the remainder deposited in the landfill. At 600 lb/cy, the annual tonnage generated would be 10,800 and the annual tonnage deposited in the landfill would be 7,560. This is in agreement with the Agency estimates based on a per capita generation rate of 4.4 lb/day and a population of 11,000, which gives an annual waste generation rate of 10,040 tons.

Clark Engineers prepared a preliminary closure plan for the landfill in accordance with the terms of the Order on Consent under which the landfill is currently operating. They estimate the remaining usable volume to be 185,000 cy or 92,500 tons at a compacted density of 1,000 lb/cy. The Agency estimates that an optimized closure plan could result in a greater remaining capacity of 260,600 tons. The site would have a remaining life of about 3-4 years as a Consolidation Landfill.

NYSDEC has found no significant contravention groundwater standards at the site. The depth to bedrock is marginal, with outcrops at several points on the site.

The Agency will, by agreement and in requirements of operations, close and monitor the landfills under the revised Order on Consent, provide for daily clay cover on each of the Consolidation Landfills.

2. Town of Ulster Landfill

The Town of Ulster landfill is located between Routes 32 and 9W about two miles north of the City of Kingston. (See Figure 4. - Town of Ulster Site Location map.) The landfill is located on a 44-acre parcel, of which about 28 acres have been used for depositing solid waste. Some portions of the site have only received a thin deposit of material, but in some of the ravines along the eastern edge of the site, the thickness of the waste material exceeds 50 feet. The site was initially used as a dump shortly after World War II. Formal use as a landfill started about 1950. (See Figure 5. - Town of Ulster Landfill Footprint map.)

The site is located in what was once a marginal agricultural area, but has become developed for industrial uses and shopping centers. There are several rock outcrops on the site and the eastern edge is adjacent to a wetlands area about 50 feet below the landfill area.

The Town's consulting engineers, Converse Consultants, estimate that the current usage of the site is about 55,000 cy per year or 27,500 tons per year. The site is being used by the Town of Ulster, the City of Kingston, and the Town of Kingston. Converse has prepared a preliminary closure plan based on application of the new Part 360 closure standards covering 22 acres of the site. If the site were to continue to serve its present users, the site would have a remaining life of about 15 years. Used as a Consolidation Landfill, the site could have a remaining life of 7-8 years.

A proposal had been made to use part of the present footprint of the site for a bypass roadway. No final decision on how the site would be developed as a Consolidation Landfill can be made until the road situation is resolved.

Subsurface investigations have revealed somewhat more than minor contravention of groundwater standards, including some organic contamination. However, the site is located in an area where all water is supplied from a municipal public water supply system and the area is fully sewered. Groundwater contamination is therefore of less significance than it would be in areas that contained water supply wells. The site is not considered suitable as a permanent site because of shallow depth to bedrock.

3. Town of Wawarsing Landfill

The Town of Wawarsing is located about five miles north of the Village of Ellenville and one-half mile west of Route 209. (See Figure 6. - Town of Wawarsing Site Location map.) The landfill was opened in 1974. The total area of the site is 60 acres with the area used for deposition of waste now covering about 16 acres. The site also contains a drop-off site for recyclable materials.

The Town's consulting engineers, CT Male Associates, have prepared a Subsurface Investigation Report which shows no significant contravention of groundwater standards.

No closure plan has been prepared by CT Male, but estimates by the Agency indicate an available volume of 703,000 cy if the site was developed to maximum slope allowed under Part 360. This capacity estimate is equivalent to 316,000 tons, which would result in a remaining site life of about 4-5 years at the usage rate contemplated under the Consolidation Plan.

The site is located in a generally wooded area. One portion of the site contours a significant deposit of clay which should be used for the closure of this and other landfills in the County.

There currently is a local law which restricts the importation of solid waste into the Town. The Town should amend its local law to all the importation of solid waste under the Agency's plan.

C. Recommended Consolidation Landfill Transportation Plan

Potential environmental impacts associated with the Landfill Consolidation Plan will be the increase in solid waste being brought to the Consolidation Landfills, and the number of truck trips necessary to get the waste there. To minimize these impacts, the three Consolidation Landfills have been selected in different sectors of the County, and are all located along major state highways. Municipalities in the northern sector of the County will use the Ulster Landfill via Route 28 and Route 9W. Municipalities in the southeastern sector will use the New Paltz landfill via Route 32 and Route 299. Municipalities in the western sector will use the Wawarsing landfill via Route 209 and Route 44/55. It should be noted that each of the Consolidation Landfills have direct access from a state highway. Trucks will not have to travel over Town or County roads within the Consolidation Landfill towns.

Further, the Agency will be providing each municipality with appropriately sized roll-off containers (compactor roll-offs where necessary) so that waste may be hauled from the municipality's Rural Transfer Station to the Consolidation Landfills in 8-10 ton loads. This will help minimize the number of truck trips per day from any given municipality. And, since the Agency's trucks will be doing most if not all of the hauling, truck traffic can be controlled. By scheduling hauls during off-peak hours, traffic congestion can be minimized.

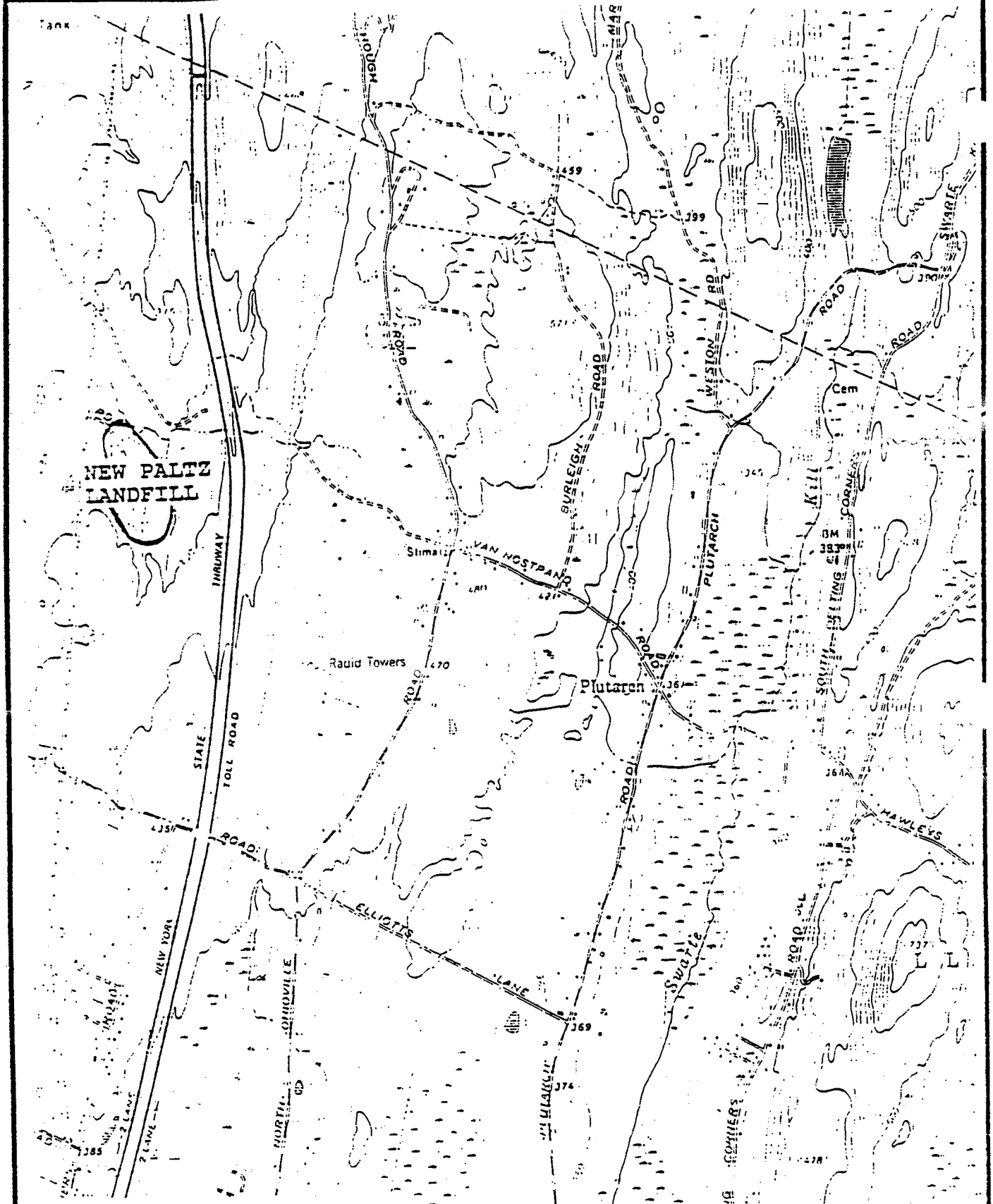
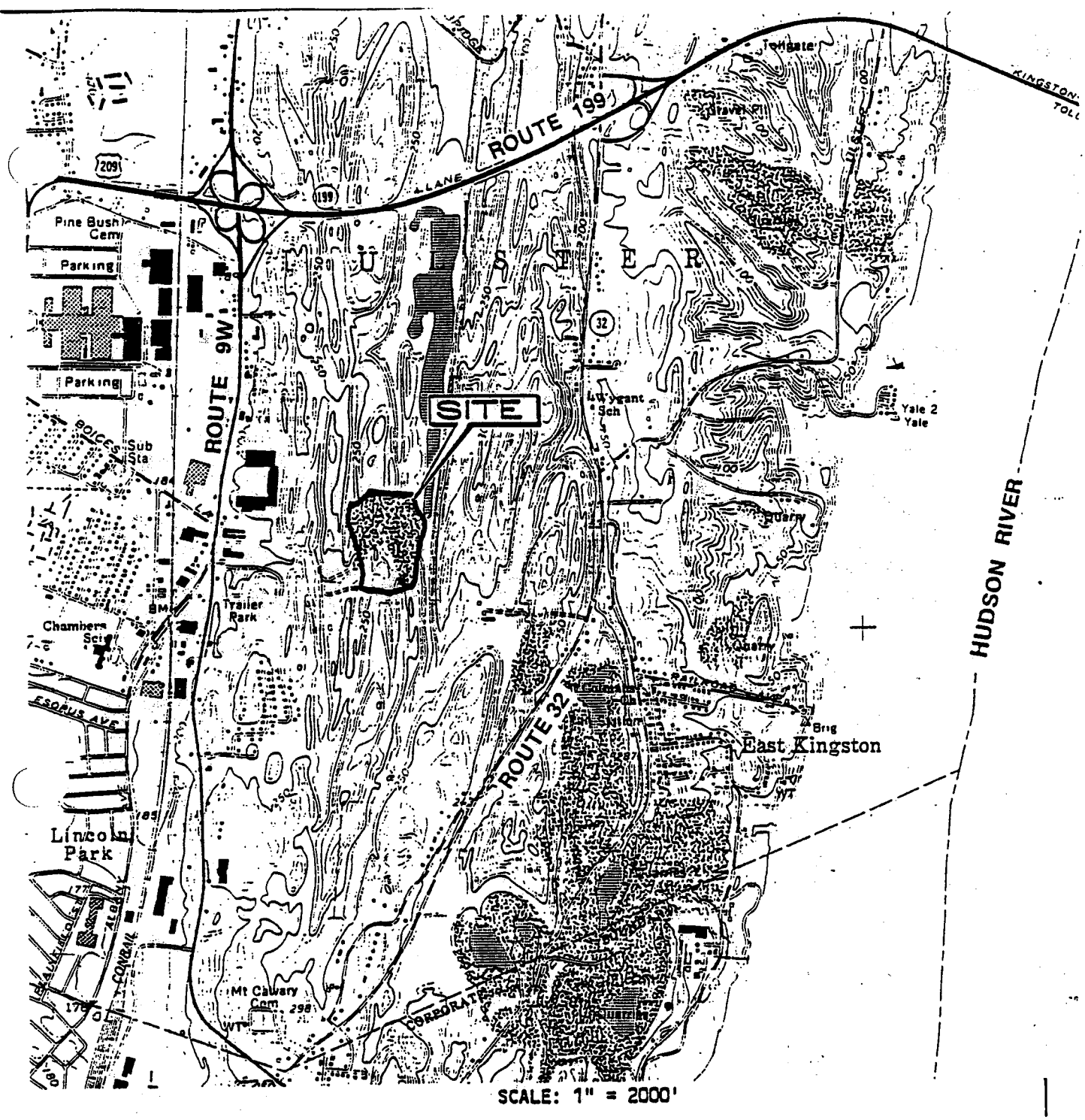


Figure 3.
Town of New Paltz
Landfill Site
Location Map

Southeast Section of Rosendale
7.5 Minute Topographic Quadrangle



MAP SOURCE: BASE MAP WAS ADAPTED FROM U.S.G.S. KINGSTON EAST, N.Y. QUADRANGLE, 7.5 MINUTE SERIES, 1963 PHOTOREVISED 1980. (BASE MAP MAY NOT REFLECT RECENT CARTOGRAPHIC CHANGES)

TOWN OF ULSTER LANDFILL
ULSTER, N.Y.
FOR TOWN OF ULSTER

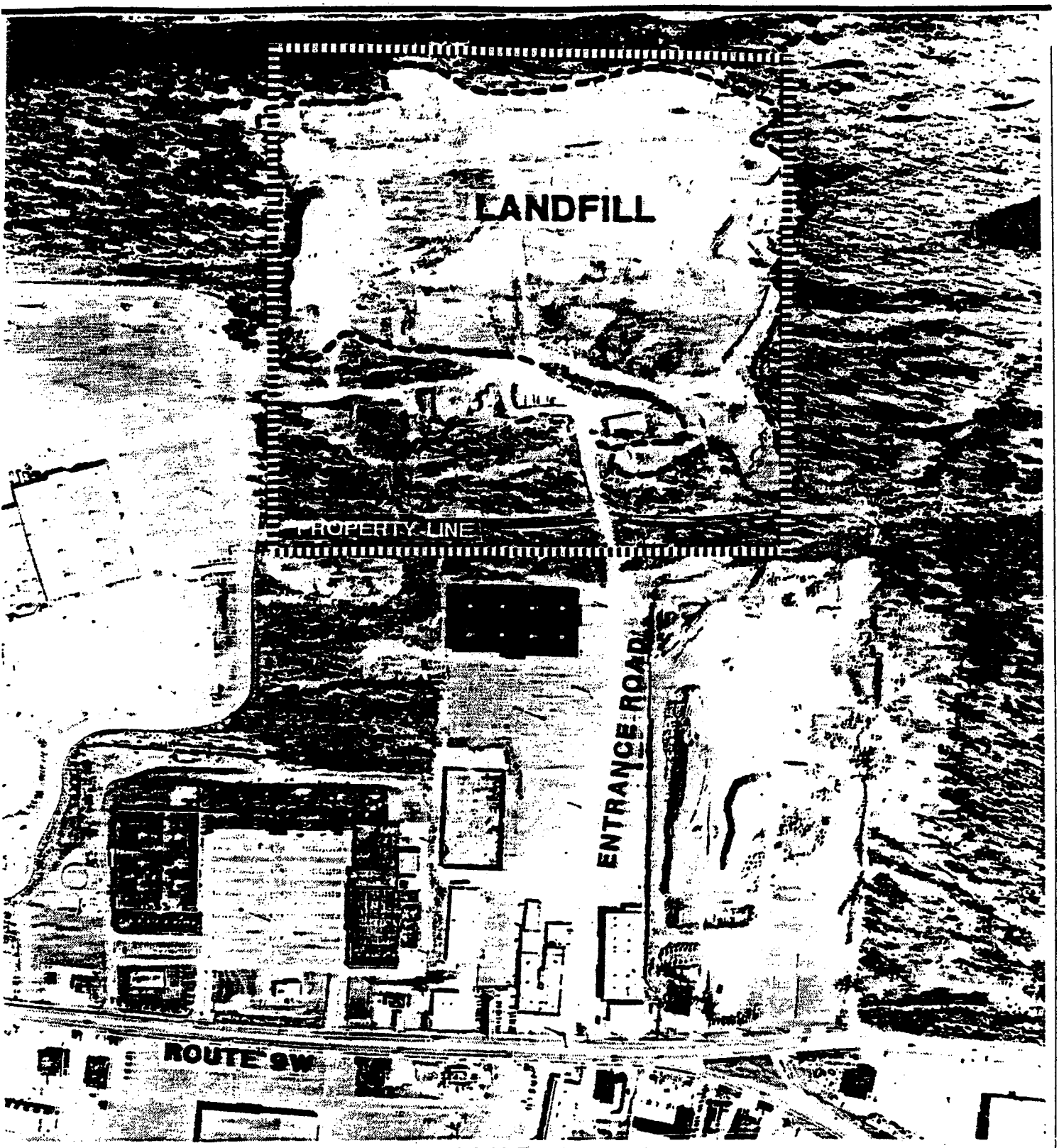
Figure 4.

Site Location Map

PROJECT No.

90-67122-06

Converse Consultants East, PC



SCALE: 1" = 400' ±

SITE CONDITIONS - MAY 31, 1991

OWN OF ULSTER LANDFILL
LSTER, N.Y.
OR TOWN OF ULSTER

Figure 5.
Landfill Footprint

PROJECT No.
90-67122-06

Converse Consultants East, PC

EDUCATION LAW

7.5 MIN USGS KERHONKSON QUADRANGLE
DATED 1973

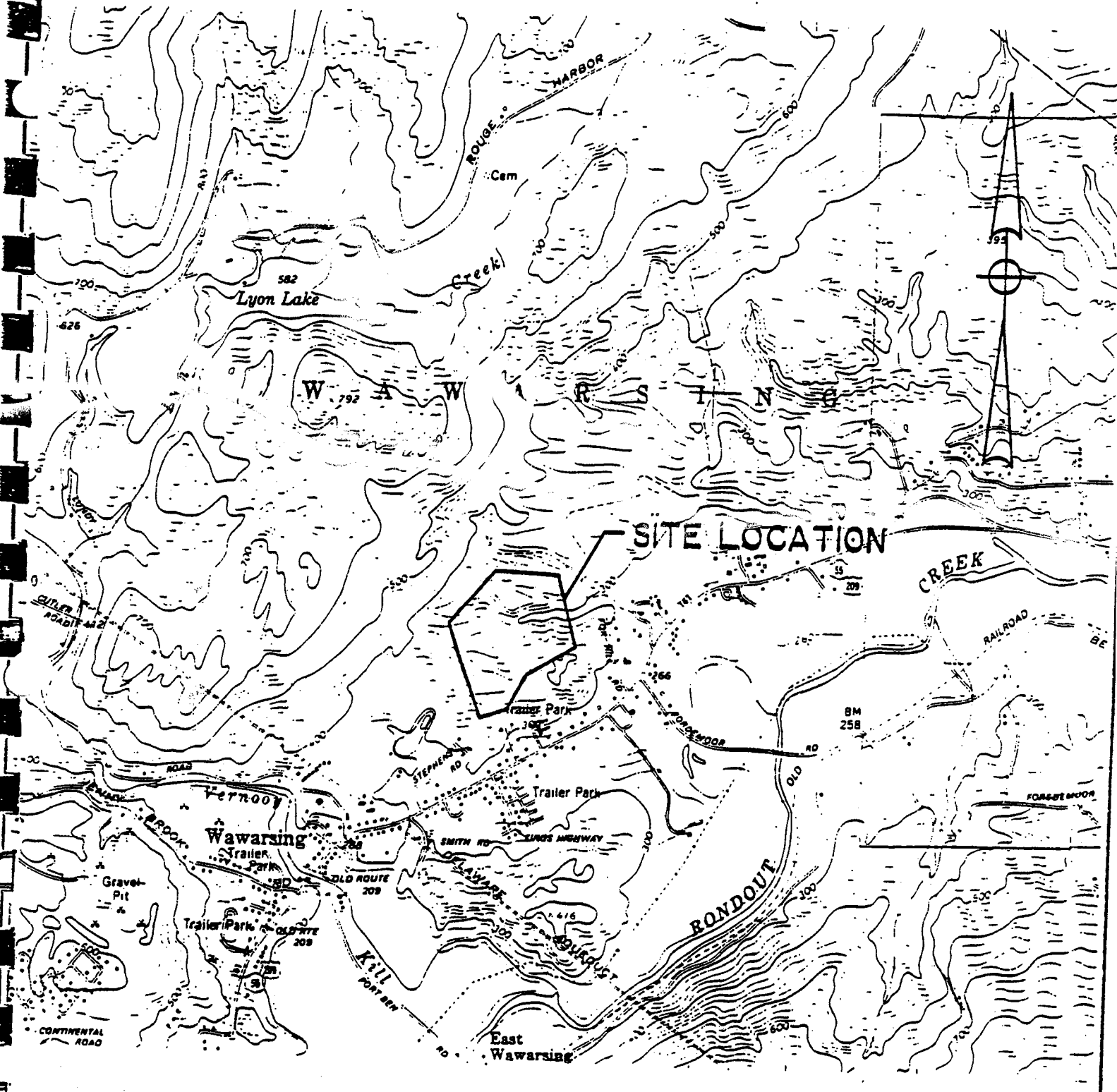


FIGURE 6

Date	RECORD OF WORK	Appr.

TOWN OF WAWARSING LANDFILL
SITE LOCATION

TOWN OF WAWARSING | COUNTY OF ULSTER

C. T. MALE ASSOCIATES, P.C.
50 Century Hill Drive, P.O. Box 727, Latham, NY 12110
(518) 786-7400
Engineering Surveying Architecture Landscape Architecture
Laboratory Services Computer Services

Drafter: TWK | Checker:
Appr. by: | Proj. No. 87.3283

SCALE: 1" = 2000' | DATE: SEPTEMBER 27, 1989

Commercial waste haulers will be directed to use the Consolidation Landfill closest to their point of origin. Their trucks will be licensed, permitted, and inspected by the Agency, the County Department of Health, and NYSDEC. Only those trucks specifically assigned to a Consolidation Landfill will be able to use it. Routes for the commercial haulers when entering the respective town will be established the Agency in cooperation with the town. All efforts will be made to ensure that commercial haulers use State highways to access the Consolidation Landfills.

Residents will not be able to use the Consolidation Landfills directly. Each municipality will have a Rural Transfer Station suited for use by their respective residential self-haulers. Residents of the Consolidation Landfill towns will also have a transfer station for their use. This should be located in close proximity to the Consolidation Landfill.

Table 8. shows the proposed allocation of municipalities to the designated Consolidation Landfills and the anticipated rates of use at those sites. This should be considered a "worst case scenario" in that 1994 solid waste generation rates were used. This is the highest of any of the years in the interim period (see Table 6.). Secondly, the estimates are based on utilizing the landfills 270 days/year (5 days/week) not 365 days/year. Third 6-8 tons/trips (rather than a possible 8-12 tons) was used in calculating truck trips.

Based on this allocation:

- The Ulster Landfill which already receives waste from the City of Kingston, Town of Kingston, and the Town of Ulster will serve an additional population of 49,650 people. This landfill will realize an increase of 178 tons/day over its present usage. This translates into approximately 17-24 additional truck trips per day.

- The New Paltz landfill which already receives waste from the Town of New Paltz. Village of New Paltz and SUNY at New Paltz will serve as additional population of 41,450 people. The landfill will realize an increase of 149 tons/day over its present usage. This translates into approximately 14-19 additional truck trips per day.

- The Wawarsing landfill which already receives waste from the Town of Ellenville and the Village of Ellenville, will serve an additional 15,400 people. The landfill will realize an increase of 55 tons/day over its present usage. This translates into 5-10 additional truck trips per day.

TABLE 8.
TRANSPORTATION PLAN
(Worst Case Scenario)

Municipality	Pop. Served Present	Pop. Served Add't	Waste Generation TPD (1)	Waste Generation TPY (2)
Ulster Landfill				
Esopus		8,550		
Hardenburgh		300		
Hurley		7,450		
* Kingston (C)	23,650			
* Kingston (T)	950			
Olive		4,250		
Saugerties		18,900		
Shandaken		3,100		
* Ulster (3)	13,000			
Woodstock		7,100		
		49,650	316	85,503
New Paltz Landfill				
Gardiner		4,150		
Lloyd		8,550		
Marlborough		7,600		
* New Paltz	11,000			
Plattekill		8,050		
Rosendale		6,150		
Shawangunk (2/3)		6,650		
		41,450	189	50,997
Wawarsing Landfill				
Denning		550		
Marbletown		5,650		
Rochester		5,900		
Shawangunk (1/3)		3,300		
* Wawarsing	13,250			
		15,400	104	28,100
TOTAL COUNTY	168,350		609	164,600

NOTES: (1) 1994 Waste Generation Rates from SWMP; Based on 270 days/year
(2) Based on 5.2 lb/cap/day or .97 tons/cap/year (after recyclin)
(*) Presently using this facility

D. Other Environmental Impacts/Benefits

1. Effects of the Action Regarding UCRRA - The potential effects of this Action on UCRRA are minimal. The responsibilities of the UCRRA will be increased in that it will begin providing solid waste management disposal service by becoming responsible for the operation of the Consolidation Landfills prior to the originally envisioned implementation of the new 6 NYCRR Part 360 landfill. The UCRRA will finance operations by charging a tipping fee at the Consolidation Landfills. The tipping fee will be established in an amount to be sufficient to cover the operating expense, closure and compliance costs, debt service payments, administrative costs and professional services costs of UCRRA during the interim period. Operations at the Consolidation Landfills will be provided by existing Town or by UCRRA employees. UCRRA staff may have to be increased to provide for increased transportation of solid waste from the rural transfer stations to the Consolidation Landfills, for inspection and weighing of solid waste at the Consolidation Landfills, and for the accounting function. Alternatively, UCRRA would continue to contract for the transportation services through the County Department of Public Works and contract with the Towns for operation of the Consolidation Landfills.

UCRRA will also have to retain professional engineering services to assist in designing and implementing the Consolidation Landfills operating and closure plans.

The issues involved in the Action would have to be addressed in connection with the siting, design, development, construction, operation and closure of the 6 NYCRR Part 360 County-wide landfill. Therefore, the only impact of the Action on UCRRA is that staff and services may have to be added sooner rather than later. Again, costs will be met by revenues charged for use of the Consolidation Landfills.

2. Effects Regarding the County as a Whole - The residents of the County will benefit from the modifications. UCRRA's immediate involvement in solid waste management will allow for a coordinated, orderly closure of the existing municipal landfills by providing ongoing disposal capacity at the Consolidation Landfills. UCRRA will agree, under the solid waste management agreements, that solid waste from all of the municipalities will have a home during the interim period. Thus, no municipality will be required to haul solid waste out of the County as some towns are presently

doing (at costs greater than UCRRA's system). Nor will Towns engage in bidding wars with each other over accepting neighboring communities' solid waste. NYSDEC and the County Health Department will not be required to mediate disputes amongst municipalities during the interim period.

There will be an organized, coordinated transition whereby the existing landfills will close pursuant to a schedule approved by NYSDEC pursuant to its enforcement authority. The landfills with the biggest environmental capacity and siting problems will be closed first. Solid waste will be directed from the municipalities to the most accessible Consolidation Landfills. Because there are three Consolidation Landfills, the transportation impacts at each site will be kept to a minimum. Only licensed private haulers or the Agency's transfer vehicles will use the Consolidation Landfills.
Finally, the implementation of the SWMP will be expedited and facilitated as UCRRA will be better situated to issue revenue bonds to finance the actions required by the SWMP including the permanent SAC program and the County-wide 6 NYCRR Part 360 landfill.

3. Effects on the Consolidation Landfill Communities - The greatest potential effect will be the increase in solid waste being brought to the Consolidation Landfills. As discussed in the LCP, the amount of solid waste to be delivered to the Consolidation Landfills is within the capacity of the Consolidation Landfills. Only the existing footprint will be used, and the height of the landfill cannot exceed 6 NYCRR Part 360 requirements.

The increase in the amount of solid waste is also mitigated by the following factors:

- solid waste will be brought to the Consolidation Landfills only by licensed private haulers (regulated by the Ulster County Department of Health and UCRRA), UCRRA's transfer vehicles or a municipality's vehicles.

- the impact of the increase will be shared by the three Consolidation Landfills.

- the Agency will designate which communities' solid waste will be taken to which landfill, and along with the Department of Health will regulate and inspect haulers, designate which routes are to be used, and will oversee the safety inspection of each vehicle.

Because of the above, increase in truck traffic at each site will be limited to 5-15 additional trips per day. Access is over State roads.

The Action will have a favorable effect on the environment of the Consolidation Landfills towns because the Consolidation Landfills will now be closed in accordance with stricter 6 NYCRR Part 360 closure requirements and UCRRA will be required to observe 6 NYCRR Part 360 operating requirements, such as the development of operating and contingency plans daily cover of solid waste, leachate control, etc. This is not being done in all instances now. Operation of the Consolidation Landfill will be closely monitored. First, the County Health Department and UCRRA will regulate all users of the Consolidation Landfills. This includes vehicle inspection, facility and route inspections and access to client data. Only designated haulers will be able to use the Consolidation Landfills. Access will be regulated by UCRRA through a gate and all waste will be weighed by computerized scales. Visual inspection of the disposal vehicle and, to some extent, the load of solid waste will be made at the scale. Solid waste will be dumped on the landfill and inspected by the operating employees before the collection vehicle leaves the site. If problems are detected, UCRRA, Town and NYSDEC monitor will be notified. If the solid waste is rejected, the company responsible for bringing the waste to the site will provide for or pay the costs of proper disposal.

The NYSDEC monitor referred to above is required by the revised consent order and will be a NYSDEC employee whose cost will be paid by UCRRA. The monitor's only assignment will be the oversight of operations at each Consolidation Landfill.

Thus, operations at the Consolidation Landfills will be more closely supervised than at present and will be subject to stricter requirements under the revised consent orders.

Closure of the Consolidation Landfills will also be subject to stricter requirements. Therefore, the long-term environmental effect of UCRRA's use of the Consolidation Landfill should be beneficial.

If UCRRA did not become involved, the Consolidation Landfills (and the other municipal landfills) would still be closed by NYSDEC under the existing consent orders. The requirements for closure would not be as strict, no NYSDEC site monitor would be provided nor would there be close scrutiny of landfill operations.

The financial impact of UCRRA's involvement is also beneficial to the Consolidation Landfill towns. Under the LCP, the revised consent orders and the solid waste management agreements, UCRRA will assume the burden of paying for the cost of operation and closure of the Consolidation Landfills. The estimates of closure and monitoring costs range from $1 million to $6 million. UCRRA will fund such costs through the tipping fee. UCRRA will also pay to the Consolidation Landfill communities a host community fee of $1.00 per ton of solid waste disposed of at the landfill for Town purposes and $.25 per ton for fire protection purposes.

The towns have been collecting a tipping fee at the existing landfills and are charging a fee to residents who use them. Costs for operating the landfills are provided in municipal budgets.

The Towns would not be able to continue landfill operations indefinitely. NYSDEC has advised the Towns that each of the landfills in the County will be closed within 1 year to 18 months. Gates to the landfills may be closed even sooner. No Town presently is seeking an upgrade of the landfill and a 6 NYCRR Part 360 permit.

The cost impact of UCRRA's takeover of the Consolidation Landfills will be beneficial in that it will relieve the Town government of the landfill operations cost and, more significantly, the closure costs. Additionally, the host community's fee will be paid. The Towns would lose a portion of the short-term revenues they would collect from users of the landfills, although they can continue to collect fees from their residents who use the rural transfer station. A portion of these fees would go to pay UCRRA for disposing of solid waste generated by Town residents.

UCRRA will also provide, as part of the modified SWMP and under the Solid Waste Management Agreement, funds to upgrade or establish a rural transfer station at the existing municipal drop-off center site. This will ensure that Town residents will continue to have the right to self-haul solid waste. UCRRA will pay up to $40,000 for such upgrading at each municipality and will obtain all necessary NYSDEC permits on behalf of the municipality.

The tipping fee to be charged by the Agency for using the Consolidation Landfills cannot be guaranteed, but based on the most current financial analysis (see, Attachment "E"), the initial fee during the interim period would be

under $50.00 per ton. This cost is competitive with other available alternatives for the Interim Period.

4. Effects Related to the Non-Consolidation Landfill Communities - The effects on the other communities would also be beneficial. By providing funds under the Landfill Closure Assistance Program ("LCAP"), UCRRA would provide direct financial assistance for the closure of the non-consolidation landfills. While the amount of money that can feasibly be raised for this purpose is only a portion of the total cost, no other agency or county in the State has committed to a similar program. Under LCAP, a portion of the financial exposure for closing the Non-Consolidation Landfills is reallocated from the taxpayers of the community to the users of the UCRRA's System. There is no requirement for this initiative. NYSDEC is the only other possible source of funding. Only one municipality (Hurley) has availed itself of this program of 50% reimbursement.

Furthermore, the non-consolidation landfill communities and communities where no landfills exist will benefit from UCRRA's assistance in developing the rural transfer stations described above. Costs of disposal for solid waste in UCRRA's System are lower than any other alternative available after the non-complying landfills are closed by NYSDEC. Transportation costs are mitigated by the strategic location of the Consolidation Landfills. Finally, each community will benefit from having a waste disposal alternative within the County, avoiding the uncertainty of the availability and cost of out-of-county alternatives.

5. SEQRA Analysis - The Action involves modification of the SWMP, approval of certain actions to implement the modification, and the exercise of NYSDEC enforcement authority.

The Action, to the extent not the exercise of NYSDEC enforcement authority as analyzed under the criteria set forth in 6 NYCRR 617.11, will not have a significant effect on the environment. Specifically:

- The Action <u>will not</u> result in any substantial adverse change in existing air quality, ground or surface water quality or quantity, traffic or noise levels. Nor will there be an increase in the potential for soil erosion, flooding, leaching or

drainage problems. The Action will improve ground water quality and surface water quality in that the Consolidation Landfills will be operated and closed under stricter 6 NYCRR Part 360 standards and closure of the other existing non-complying solid waste landfills in the County will be coordinated, occur sooner under the action and will benefit from funds in the LCAP. There will be no substantial increase in solid waste production (in fact a decrease is expected due to recycling) and the increase in truck traffic at the Consolidation Landfills will be minimal, in the range of 5-15 additional truck trips per day.

- o The Action will not result in the removal or destruction of large quantities of vegetation or fauna; substantial interference with the movement of any resident or migratory fish or wildlife species; impacts on a significant habitat area; substantial adverse effects on a threatened or endangered species of animal or plant, or the habitat of such a species; or other significant adverse effects to natural resources.

- o The Action will not encourage or attract a large number of people to a place or places for more than a few days, compared to the number of people who would come to such place absent the Action.

- o The Action will not result in the creation of a material conflict with a community's current plans or goals as officially approved or adopted. Actually, it will help facilitate and expedite the implementation of the goals set forth in the SWMP.

- o The Action will not result in the impairment of the character or quality of important historical, archeological, architectural, or aesthetic resources or of existing community or neighborhood character.

- o The Action will not result in a major change in the use of either the quantity or type of energy.

- o The Action will not create a hazard to human health. It will instead protect human health by providing for the coordinated closure of non-complying landfills and the closing of Consolidation Landfills under stricter standards.

- There will be no substantial change in the use, or intensity of use, of land including agricultural, open space or recreational resources, or in its capacity to support existing uses. Existing footprints of existing landfills will be used only up to their capacity. The increased amount of waste to be disposed of at the Consolidation Landfills beyond that originally planned will be disposed of in accordance with the stricter operating and closure requirements of 6 NYCRR Part 360.

- The Action will not result in the creation of a material demand for other actions which would result in one of the above consequences.

- There will not be changes in two or more elements of the environment, no one of which has a significant effect on the environment, but when considered together result in a substantial adverse impact on the environment.

- Finally, there are not two or more related actions undertaken, funded or approved by an agency, none of which has or would have a significant effect on the environment, but when considered cumulatively, would meet one or more of the criteria in this section.

VI. IMPLEMENTING THE LANDFILL CONSOLIDATION PLAN

A. Negotiations with Selected Municipalities

All three municipalities have indicated a willingness to enter into agreements with the Agency to lease to the Agency the portion of their landfill sites required for operational control. It is the Agency's intent not to take more of the site than is required for proper operation of the landfill. Areas that are covered with less than (10) feet of waste will be stripped to the original surface so as to minimize the areas requiring ultimate closure. Specific conditions are now being negotiated with each of the municipalities concerned. A copy of a draft agreement between the municipalities and the Agency can be found in the EAF, Exhibit 1., Attachment C-3.

Attachment No. 1

617.21
Appendix 1
State Environmental Quality Review
(SEQR)

FINDINGS STATEMENT

Name of Action:

Ulster County Integrated Solid Waste Management Plan

Facts and Conclusions in the EIS Relied Upon to Support the Decision:
(Continued)

complies with Section 27-0107 of the ECL. Under this plan, Ulster County intends to sponsor a multi-faceted source separation and materials recycling program, including construction of a Satellite Aggregation Center to process recyclable materials; a yard waste composting program; and to achieve a 52% waste reduction, reuse and recycling rate by 1997. Ulster County will also pursue siting a new municipal solid waste landfill to handle waste that will not be reduced, reused or recycled.

Identification Number: C809021

Name of Action: Ulster County Integrated Solid Waste Management Plan

CERTIFICATION OF FINDINGS TO APPROVE/FUND/UNDERTAKE

Having considered the Draft and Final EIS, and having considered the preceding written facts and conclusions relied upon to meet the requirements of 6 NYCRR 617.9, this Statement of Findings certifies that:

1. The requirements of 6 NYCRR Part 617 have been met;

2. Consistent with the social, economic and other essential considerations from among the reasonable alternatives thereto, the action approved is one which minimizes or avoids adverse environmental effects to the maximum extent practicable; including the effects disclosed in the environmental impact statement, and

3. Consistent with social, economic and other essential considerations, to the maximum extent practicable, adverse environmental effects revealed in the environmental impact statement process will be minimized or avoided by incorporating as conditions to the decision those mitigative measures which were identified as practicable.

New York State Department of Environmental Conservation
Name of Agency

Signature of Responsible Official

Norman H. Nosenchuck
Name of Responsible Official

Director, Division of Solid Waste
Title of Responsible Official

DEC 0 3 1991
Date

50 Wolf Road, Albany, New York 12233-4010
Address of Agency

New York State Department of Environmental Conservation
Region 3
21 South Putt Corners Road
New Paltz, NY 12561-1696
914-255-5453

1/10/92

Attachment A
Item A-2

Thomas C. Jorling
Commissioner

January 8, 1992

Mr. Charles Shaw
Executive Director
Ulster County Resource Recovery Agency
52 Main Street - UPO Box 4298
Kingston, New York 12401

Dear Mr. Shaw:

During the December 19, 1991 meeting of the Ulster County Legislature, questions were raised regarding a proposal that the Ulster County Resource Recovery Agency (UCRRA) operate two to four town landfills during an interim period of three years until implementation of the recently approved Ulster County Solid Waste Management Plan (SWMP). Due to the legislature's desire for an expedited response, rather than waiting for your formal written request, the questions were immediately sent to the Division of Solid Waste. Subsequently, your January 6, 1992 letter, addressed the UCRRA's proposed activities and formally requested an opinion. The purpose of this letter is to provide you with the Department's position in these matters.

First, the DEC does not believe that the proposal to operate certain town landfills by the UCRRA is presently included or reflected in the approved SWMP. Therefore, pursuant to Section 360-15.11, Modification To Plans, any activity by the UCRRA to operate the landfills on an interim basis, must be reflected through a modification to the SWMP. This process was mentioned to you in Norman Nosenchuck's December 3, 1991 SWMP approval letter sent to your agency. Please note that the DEC generally supports positive modifications to local SWMP's. However, it is imperative that any modification be supported by adequate information to justify the change. This modification should not require any extensive, time consuming effort by the UCRRA; but, it is necessary to fully describe the modification and its expected benefits. In regard to the benefits, we have discussed them in our previous meetings; some of them were acknowledged and included in Richard Gardineer's November 4, 1991 letter to you.

Second, in regard to the State Environmental Quality Review (SEQR), the proposed changes to the SWMP should be reviewed to determine if they are subject to SEQR. Since this project involves decision-making and funding activities, SEQR requirements regarding selection of Lead Agency, environmental assessment, and a decision on significance appear to be required at a minimum. It is reasonable to combine SWMP/SEQR with the undertaking/funding SEQR

obligations described above. Please note that in any event, the SWMP modification must contain an accounting for the comments by concerned individuals in accordance with Subdivision 360-15.9(o).

Third, The DEC does not have any approval authority over the method of financing used by your agency or by any planning units to fund their solid waste programs. However, as required by Subdivision 360-15.9(m), the SWMP modification must contain as analysis of the financing mechanisms that will meet the anticipated costs.

Assuming that your agency wishes to continue with this proposal, Rich Gardineer and his staff will meet with you to discuss the needed content for the revision to the SWMP, including preparation of a Landfill Consolidation Plan. As you acknowledged in your January 6, 1992 letter, this plan is required pursuant to the Commissioner's Enforcement Directive II.14, entitled "Closure of Active Solid Waste Landfills", dated December 29, 1988. Margaret Duke and/or her staff will be available to answer any questions concerning pertinent SEQR obligations. And, Judith Ferry will begin negotiating the Consent Orders for the operation of the landfills by the UCRRA, which will be executed upon approval of the SWMP revisions.

If your agency or the legislature has any additional questions, please contact the appropriate staff or me at this office.

Respectfully,

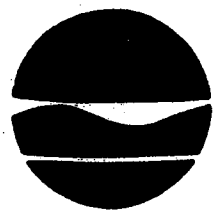
Ralph Manna.Jr.
Regional Director
Region 3

cc: Gerald Benjamin, Chairman
Honorable Maurice Hinchey
Legislator James O'Reilly
N. Nosenchuck/D. Blackman
M. Duke
R. Gardineer
J. Ferry

Attachment A
Item A-3

11/7/91

New York State Department of Environmental Conservation
Region 3
21 South Putt Corners Road
New Paltz, NY 12561-1696
914-255-5453



Thomas C. Jorling
Commissioner

November 4, 1991

Mr. Charles Shaw
Ulster County Resource Recovery Agency
52 Main Street - UPO Box 4298
Kingston, New York 12401

Dear Mr. Shaw:

Pursuant to your recent verbal request, this is to address the DEC's position regarding the involvement of your agency in the operation and closure of the presently active municipal landfills in Ulster County.

As you know, Region 3 has two primary goals in the regulation of solid waste. The first is the preparation and implementation of county solid waste management plans. The second is the phase-out and closure of the existing sanitary landfills in an orderly manner. Based on the plan expressed by you during our most recent meeting, the county's desire to participate in the closure of the landfills does appear to be helpful in this Region attaining the aforementioned goals in Ulster County. This will be explained in more detail below in this letter.

The preparation and implementation of County or Regional Solid Waste Management Plans (SWMP's) will ultimately end the existing capacity crisis in New York State. Unfortunately, there is a transition stage between the formulation of the SWMP and the actual operation of the landfill, the Materials Recovery Facility (MRF), the transfer stations, and any other needed Solid Waste Management Facilities. During this period it was anticipated that the towns would continue to operate their landfills while the counties are preparing the Part 360 applications for the needed county solid waste management facilities. Upon completion of these new facilities, the each county would then take over the solid waste handling. In effect there would not be any transition period where the county gradually took over its new role.

There was also a question concerning flow control as to when should the counties implement this measure to ensure that the waste stream will be coming to the county facilities. This is needed in sizing the facilities and more importantly, in getting financing to build the facilities. The bonding companies want to see control of the waste so that it won't "disappear" after the facilities are built. The participation of the county during this earlier period should result in earlier flow control ordinances and a stabilized rate of waste generation. This earlier involvement will help in the attainment of a the bonding for the construction of the facilities.

The second goal is the orderly phase-out and closure of the existing municipal landfills in the region. The landfills are now undergoing the subsurface investigations and the results for some of the sites have been received. The closure dates of each of the landfills will be based upon the environmental setting of the site, the nature of the contaminants found in the environmental samples and the availability of another method of solid waste disposal for the municipality. As an example, if a landfill was located on a Principal Aquifer, toxic metals and/or solvents were present in the groundwater, and another landfill was available, then that landfill would be closed quickly. The presence of the county as the operator of the designated landfills will allow for the movement of waste from the towns, whose landfills mist immediately close, to town landfills that would be allowed to operate until the county facilities are permitted and constructed. Three or four landfills could handle the entire county during this transition period. The selection of these landfills will be mutually agreeable to the county and the DEC. Municipalities whose landfills are found to need immediate closure, would not have to ship their waste out-of-state at high tipping fees; in addition, it is understood that the county would work the towns who have to close their landfills. This generic approach to closure should reduce the closure cost for each of the towns.

In closing, it must be noted that the proposed action by your agency is not mandated or in any way required by the DEC. However, it does appear to be consistent with and to further the regional goals explained earlier in this letter. If this letter does not adequately state the information presented by you, please contact me immediately at this office.

Respectfully,

Richard A. Gardineer

Richard A. Gardineer, P.E.
Regional Solid Waste Engineer
Region 3

cc: Richard Mathews
Ralph Manna
Norman Nosenchuck
Steve Parisio/Perry Mehta
Al Klauss

APPENDIX B

REFERENCES

VIII. REFERENCES

1. Ulster County Final Solid Waste Management Plan; Ulster County Resource Recovery Agency, Kingston, NY; October, 1991

2. Draft Generic Environmental Impact Statement on Solid Waste Management Planning, Volume II; Ulster County Resource Recovery Agency, June, 1989

   Appendix C - Landfill Profiles
   Appendix N - Economic Analysis for Use of Existing Landfills
   Appendix O - Engineering Analysis for the Use of Existing Landfills

3. Supplemental Draft Generic Environmental Impact Statement on Solid Waste Management Program. Ulster County Resource Recovery Agency, April 5, 1990, Chapter 4.0, Review of Existing Landfills.

4. Landfill Orders on Consent, Town of Gardiner, NYSDEC, August 25, 1987; (as typical sample of orders in effect on all existing landfills)

5. Landfill Order on Consent, Town of Hurley, June 28, 1991

6. Enforcement Directive, II.14 - Closure of Active Solid Waste Landfills; NYSDEC 9/17/84, Revised 12/29/88

7. Letter - R. Gardineer, NYSDEC Region III to UCRRA, dated November 4, 1991 on involvement of UCRRA in the operation and closure of existing landfills

8. Letter - R. Manna, Jr., NYSDEC Region III to UCRRA dated January 8, 1992 on UCRRA operation of town landfills during interim period

9. Draft - Guidance for Modification of NYSDEC Approved Solid Waste Management Plans, NYSDEC, January 28, 1992

10. Letter R. Gardineer, NYSDEC Region III to Assemblyman Hinchey dated 1/24/91 on site conditions at existing Ulster County Landfills

11. Landfill Closure Report, Town of Lloyd Landfill, Clough Harbour and Associates, Albany, NY, March 1991

12. Closure Plan, Town of New Paltz Landfill, Clark Engineers & Associates, Rochester, NY December 1991; including Subsurface Investigation Report by Mid-Hudson Geosciences, New Paltz, NY May 1991

13. Preliminary Results of Subsurface Investigation, Town of Ulster Landfill, Converse Consultants East, P.C., New York, NY, December 20, 1991

14. Draft Environmental Impact Statement, Town of Ulster Road Improvements, Planning, Programming, Budget Services, Highland Mills, NY 1990

15. Preliminary Water Quality Results, Town of Wawarsing Landfill, CT Male Associates, Latham, NY, January 6, 1992

16. Subsurface Investigation Report, Ulster, March 1992 Subsurface Investigation Report, Wawarsing, March 1992
Subsurface Investigation Report, New Paltz, May 1991

17. Municipal Landfill Subsurface Investigation Report, Town of Lloyd, Clough Harbour & Associates, May 16, 1990.

18. Addendum to Subsurface Investigation Report, Municipal Landfill, Town of Lloyd, Clough Harbour & Associates, July 1, 1991

19. Subsurface Investigation Report, Town of New Paltz Landfill, Mid-Hudson Geosciences, May 18, 1991

20. Site Investigation Report of Phase 1. Activities, Town of Woodstock Sanitary Landfill, Dunn Geoscience Corp., January, 1991

21. Site Investigation Report (SIR), Town of Esopus Landfill, Ulster County, New York, October, 1991

22. Closure Plan for the Hurley Landfill, Town of Hurley, Ulster County, New York, Morris Associates, December, 1991

23. Subsurface Investigation Report (SIR), Town of Rochester Landfill, CT Male Associates, October, 1991

24. Subsurface Investigation Report (SIR), Town of Wawarsing Landfill, Ulster County, New York, CT Male Associates, March, 1992.

Attachment B.

PROPOSED MODIFICATIONS TO THE SOLID WASTE MANAGEMENT PLAN

Note: This attachment contains proposed modifications to the Ulster County Solid Waste Management Plan which was approved by NYSDEC, December, 1991

1. The page number at the bottom of each of the following pages corresponds to the respective page found in the approved Solid Waste Management Plan.

2. The words (**Modifications Added/Deleted 8/92) found in the left-hand margin of each page denotes where in the text the modification has been made.

3. The bold printed, underlined text found to the right of the words (** Modifications Added/Deleted 8/92) represents the modified language.

II. TABLE OF CONTENTS

TABLE OF CONTENT (con't)

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

12.0 REFERENCES

LIST OF FIGURES

LIST OF FIGURES (con't)

LIST OF FIGURES (con't)

10.0 GENERIC ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

11.0 PUBLIC PARTICIPATION - SEQRA COMPLIANCE

12.0 REFERENCES

ULSTER COUNTY SOLID WASTE MANAGEMENT PLAN

EXECUTIVE SUMMARY

The development of a solid waste management plan ("The Plan") for Ulster County (the "County") is authorized by the New York State Solid Waste Management Act of 1988. It is subject to the New York State Environmental Quality Review Act ("SEQRA") process and solid waste planning regulations set forth in 6 NYCRR Part 360-15 administered by the New York State Department of Environmental Conservation ("NYSDEC"). SEQRA suggests a Generic Environmental Impact Statement ("GEIS") as a means for agencies to review the conceptual framework of a proposed plan, thus giving early consideration to environmental factors, as well as social and economic issues.

The Ulster County Resource Recovery Agency ("UCRRA") was authorized by the County Legislature to develop "The Plan" and conduct the SEQRA review. UCRRA conducted a SEQRA review of the Plan which resulted in the approval of a Final GEIS and the issuance of a Findings Statement in September of 1990. The SEQRA process addressed the environmental, social, and economic impacts of "The Plan", identified potential areas for siting facilities, and recommended technologies for solid waste management facilities.

Implementation of "The Plan" will require the preparation of a specific Environmental Impact Statement to address site and technology specific environmental impacts and support permit applications to NYSDEC.

After completion of the SEQRA process, "The Plan" was presented to and approved by UCRRA and the County Legislature in May of 1991. It has been presented to NYSDEC for approval.

GOALS

The overall goal of the Solid Waste Management Plan is to provide an environmentally sound and cost effective solution to the problems associated with the collection, transportation, processing, and disposal of municipal solid wastes generated in the County. "The Plan" covers a 25 year planning period from 1989-2014. A 5-year interim period from 1989-1994 is necessary for the planning, design, siting, and construction of the various solid waste management facilities called for. These

facilities are expected to be fully operational during their 20-year life, 1994-2014. Some may be functional beyond this time frame.

(**Modification Added 8/92) **During the interim period, UCRRA will implement reduction reuse, and recycling programs, including interim Satellite Aggregation Centers, obtain legal authority from the County Legislature to manage the Solid Waste stream, develop and implement a Landfill Consolidation Plan and Landfill Closure Assistance Program, and issue its first series of revenue bonds.**

COMPONENT ACTIONS

After an extensive evaluation of the alternatives and a determination to meet the goals and objectives of the waste management planning efforts, the County has developed a comprehensive Solid Waste Management Plan based on an integrated system of component actions and a decentralized system of solid waste management facilities (i.e., Recycling Centers, Compost Facility, Transfer Stations, Landfill, etc.).

In keeping with State policy on Solid Waste Management, the County "Plan" embraces the major elements of the solid waste management planning hierarchy and appropri- ately designates waste reduction and recycling (including composting) as the cornerstone of "The Plan". The major program components of the Ulster County "Plan" are as follows:

- **Waste Reduction/Reuse through legislation and education**
- **Household Hazardous Waste - separation, collection, and reuse or disposal programs**
- **Recycling - Satellite Aggregation Center System (SAC) - for major materials recycling identified in the Intermunicipal Agreements (IMAs) with Ulster County municipalities**
- **Recycling - miscellaneous materials recycling program for materials not identified in the IMAs (ie. textiles, batteries, tires, appliances, etc.)**
- **Recycling - Legislative Educational and Institutional programs**
- **Facilitate a construction and demolition debris recycling and volume reduction program**
- **Municipal Organic Waste Composting and Diversion programs to include:**
  - **Municipal Yard Waste Composting program**
  - **Sewage Sludge Management program**
  - **Food Waste Diversion program**

**Modification Added 8/92)

The Agency finds that it should also seek proposals for out-of-County disposal of solid waste as a backup to the interim system, in case one or more of the Consolidation Landfills cease to be available for Agency use. While out-of-County disposal is not an acceptable technology for the long-term, such agreements could be used as short-term alternatives if something unforeseen should occur.

During this period, the remaining existing municipal landfills will be closed under the Landfill Consolidation Plan. Closure will be scheduled to occur in a coordinated manner. The Agency finds that it should assist the municipalities in closure by providing funds to assist and hopefully expedite closure. A fund of $6.5 million is proposed to be financed by the Agency revenue bonds, which funds will be allocated according to a formula to be agreed upon by Agency and County Legislature amongst the municipalities to assist in closure. This program is called the Landfill Closure Assistance Program.

Closure will, of course, be coordinated with and regulated by NYSDEC.

The Agency will negotiate solid waste managemnt agreements with the municipalities who will provide, amoung other things, that the Agency will receive, process, and/or dispose of solid waste and receive, process, and market recyclable materials during the interim period and the balance of the term of the "Plan".

The time line for implementing the various components and actions related to the Landfill Consolidation Plan can be found in Figure 9-4A, Implementation Schedule for Landfill Consolidation (1992-1995) on page 9-63A.

9.4 FINANCING THE "PLAN"

Funding for "The Plan" and related studies, recycling development projects, recycling expansion, and the SAC System have been provided by the Ulster County Legislature, pursuant to an agreement with the Agency dated as of December 1, 1988, as amended. The County Legislature has authorized the issuance of capital notes

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This disposal capacity must be at the most environmentally sound, existing landfills having sufficient capacity, and use of these landfills must be coordinated so all solid waste that cannot be recycled during this phase is disposed of in an environmentally sound and economical manner.

Therefore a Landfill Consolidation Plan will be developed which analyzes the existing municipal landfills, and rates them in degree of acceptability for use during this interim period. The Landfill Consolidation Plan will be developed using information gathered by NYSDEC, the Ulster County Department of Health, and the municipalities in connection with closure of the landfills under the NYSDEC Orders on Consent.

The Landfill Consolidation Plan will identify at least three landfills which would be operated safely and economically over the interim period and receive all solid waste generated in the County not capable of being recycled. These interim landfills would be called Consolidation Landfills.

The Agency finds, that as the entity empowered by statue to implement the SWMP and by law to control the solid waste stream, it would take over the Consolidation Landfills through agreements to be negotiated with the municipalities which own them. Authorization to operate and close the Consolidation Landfills will be provided by revised or reissued Orders on Consent with NYSDEC. The Agency will assume responsibility for operating, upgrading, and closing the Consolidation Landfills. While this may increase the liability of the Agency if any problems arise at the Consolidation Landfills, the Agency finds that the risk is sufficiently mitigated by selection of the safest landfills for such purpose and NYSDEC's approval of the Agency's takeover pursuant to the Orders on Consent. The risks are justified because the Agency will them be able to assume responsibility and control of the County's solid waste stream, ensuring that, in the interim period, solid waste disposal is handled in the most efficient, coordinated, environmentally sound and economical manner.

The Agency finds that it will direct waste from various portions of the County to the most convenient interim landfill. It is proposed that the Consolidation Landfills be utilized for a period of no more than three years, and will be closed as soon as practical after the new Part 360 Countywide landfill begins operation.

Landfill Siting Recommendation - based on the above considerations, UCRRA concludes and recommends the following:

- That a supplement to the Final GEIS must be prepared before the action of selecting a preferred site for on-site review and permitting pursuant to SEQRA and 6 NYCRR Part 360;

- That the appropriate procedures for conducting such on-site review is a supplement to the Final GEIS as defined in 6 NYCRR Part 617.15 (c). This procedure will provide the most significant and meaningful opportunity for public review and comment on the work contemplated;

- That soil stability, hydrogeologic, and archaeologic issues should be reviewed further in on-site testing of at least two candidate areas;

- That the work should be phased so that testing is accomplished in the following order: first, soil stability; second, hydrogeologic conditions; third, archaeological conditions;

- Upon completion, the testing will be evaluated to exclude areas not meeting the basic condition for construction of a landfill and to select an appropriate area for site specific review and permitting;

- That the scope of on-site testing will be established after scoping sessions pursuant to 6 NYCRR Part 617.7; and

- That UCRRA shall seek funding for such on-site testing from the County Legislature pending issuance of UCRRA's revenue bonds.

The time line for implementing the various components and recommendations related to landfill siting, permitting, and construction and operation can be found in the implementation schedule on page 9-54.

9.3.11 LANDFILL CONSOLIDATION PLAN (See Volume II, Modification to Ulster County Solid Waste Management Plan)

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UCRRA finds that the existing municipal landfills which are subject to NYSDEC Orders on Consent will be closed in the near future. UCRRA finds that a coordinated, expeditious closure of the landfills is in the best interest of the people of the County. UCRRA further finds that there must be adequate capacity for solid waste disposal between the present and the construction and operation of permanent facilities. This

The Initial Siting Study focused on finding a site or sites for co-located facilities and did not emphasize siting criteria most applicable to the selected technology - landfilling. This siting study used some criteria earlier in the process than provided for in 6 NYCRR Part 360. It also used a numerical matrix to apply preferential criteria and included on-site testing of the preferred sites as the final testing phase.

The Supplemental Analysis focused on siting a landfill only. It looked at certain areas of the County containing glacial-lacustrine clays. It followed the strictures of 6 NYCRR Part 360 for landfill siting and used a comparative analysis to evaluate candidate areas. No on-site testing was performed, only visual inspection of the candidate areas was done.

For the purpose of this "Plan", UCRRA determined that:

- The Initial Siting Study in the Draft GEIS and the Supplemental Siting Analysis in the Supplemental Draft GEIS, together, provides a firm basis to conclude that all appropriate areas of the County have been reviewed and analyzed for landfill siting purposes and that no superior sites have been overlooked;

- Based upon a hard look at the Initial Siting Study and the Supplemental Siting Analysis, results of these two studies have produced 23 potential candidate areas for landfill development that are reasonable and appropriate.

Figure 9.2 shows the general locations of the 23 potential candidate areas. UCRRA is not prepared to make a findings as to the recommended site for site-specific environmental review and permitting pursuant to 6 NYCRR Part 360 at this time. UCRRA believes that on-site testing must be performed on at least two candidate areas before selection of a preferred site. During the public comment period in May 1990, and in subsequent discussions with NYSDEC, several issues were raised which UCRRA considers are in need of further study. These issues include questions on soil stability, hydrogeology of soils, and archaeologic sensitivity of candidate areas.

While lacustrine clay deposits are preferred for landfill siting, they frequently have a high water table and are poorly drained due to low permeability. This raises hydrogeologic issues.

Lacustrine clay has also been identified as having a lower shear strength than glacial tills. While 6 NYCRR Part 360 states that a landfill must not be constructed in an unstable area, it is recommended in the DGEIS and the S-DGEIS that the lacustrine clays on the candidate sites have sufficient strength to support safe development of a landfill. Through documentary review, no other information that would classify the candidate areas as being unstable was adduced.

Enactment of Waste Stream Control Legislation is critical to ensure that solid waste is disposed of properly under the solid waste management program, and to ensure that solid waste generated in the County will be brought to the facilities to generate revenues to pay for debt service and operating costs.

Solid Waste Disposal Agreement - A solid waste disposal agreement between the County government and UCRRA should be reviewed with financial consultants and, if appropriate, be prepared as part of the financing of a landfill facility.

Financing - Revenue bonds should be issued by UCRRA to finance UCRRA's facilities, not general County debt. Since the General Obligations bonds impact the County government's debts limit, revenue bond financing should be pursued as the primary financing tool for all facilities.

An agreement between the County and UCRRA ensuring that solid waste generated in the County will be delivered to the landfill to pay the capital and operating cost of the landfill, should be pursued. Such an agreement may be a necessary prerequisite to the issuance of revenue bonds.

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A Solid Waste Management agreement between the Agency and the municipalities within the County will also be pursued providing for the municipalities to send solid waste to the Agency's facilities and for the Agency to receive and dispose of such waste. A comprehensive agreement may be considered combining the IMAs, MCAs, and the solid waste obligations with one comprehensive agreement.

Ownership/Procurement - Public ownership of facilities offers the greatest degree of control, which is important in long-term projects that address significant environmental issues and involve substantial capital and operating expenditures. While private ownership allocates more of the operating risks to the private vendor, the community will continue to have the ultimate responsibility for disposal of its solid waste should the vendor be unable to fulfill its obligations.

For the above reasons, UCRRA recommends that ownership and control be in the hands of a public agency. This is the only way that the continued operation of a solid waste management facility, in accordance with environmental law, can be guaranteed.

Landfill Siting - During the course of its preparation of the Solid Waste Management Plan, the Agency authorized its consultants to prepare two landfill siting studies. One was called the **Initial Siting Study** (DGEIS, Volume I, Section 7.0) and the other is the **Supplemental Siting Analysis** (SDGEIS, Section 2.0). Both are discussed in more detail in Chapter 8.0 of this document.

- Procure landfill and related facilities pursuant to authority in the General Municipal Law;

- Conduct or monitor the design and construction of the landfill and related facilities; and

- Control access to the landfill and related facilities by ownership of the facility and operation of the scale house.

Landfill Size - The landfill facility shall be planned to be of sufficient size to handle the solid waste generated in the County for at least a twenty-year planning period. An acceptable size for a landfill footprint, based upon the projected solid waste stream for the County and implementation of an aggressive reduction, reuse, and recycling program consistent with State goals, is 100 acres. The landfill shall be developed in small, manageable cells, ranging in size from a minimum of 5 acres to approximately 10 acres, as needed. Actual size of landfill cells will depend upon site conditions, regulatory requirements, and overall design of the facility.

The size of the proposed landfill reflects a conservative estimate which will provide the County with a maximum flexibility depending upon the success of the reduction, reuse, and recycling program, increase of solid waste generation rates due to population growth or development of innovative technology during the planning period.

Landfill Siting - The landfill facility shall be sited within the County of Ulster to handle its needs. Exportation of solid waste to other areas of the State or country is rejected as unreliable and costly. Participation in a regional facility, at the present time, is rejected as no such facility is being planned by either the public or the private sector, and, optimally, each planning unit should develop its own solid waste disposal strategy within its own jurisdiction for maximum control.

Waste Stream Control - Waste stream control legislation as authorized by Section 2050-t of the Public Authorities Law shall be prepared and submitted to the County Legislature for consideration as it provides an essential guarantee that solid waste generated within the County will be disposed of in a safe and economical manner at the Countywide landfill facility.

The County Legislature has authority to establish reasonable limitations on solid waste transportation and disposal including the direction of the solid waste to a specific facility. This authority superseded that of local governments.

Single New Capacity Landfill - That a single "new capacity" 6 NYCRR Part 360 landfill is necessary to meet the disposal needs of the County for the 20 year planning period 1994-2014.

Landfill Technology - When implemented pursuant to 6 NYCRR Part 360 together with an aggressive waste reduction, recycling/composting program, it represents the most cost effective and environmentally sound strategy for solid waste management in Ulster County.

Landfill Design - UCRRA shall undertake to site, design, finance, construct, and operate landfill technology as the County's primary disposal strategy.

Single Landfill - The "Plan" contains a recommendation for a single, new capacity landfill.

SEQRA Compliance - Siting, constructing, and operating a single, Countywide landfill in accordance with SEQRA and 6 NYCRR Part 360 is the most environmentally sound and cost effective alternative for solid waste disposal.

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Use of Existing Landfills - No existing landfills in the County could be developed as an alternative to a new landfill.

Reclamation of Landfills - Technology for reclamation of existing landfills is in a developmental stage in certain parts of the United States and is in a research and developmental stage in New York State. Consequently, it is not presently available as a practical, economical, and environmentally sound means to expand capacity at existing landfills as a Countywide solid waste disposal solution.

Transfer Stations - The development of transfer stations strategically located in the County, possibly at existing municipal solid waste management sites, would provide a cost effective method for transporting waste to a single County landfill. Use of transfer stations will also reduce impacts at the County landfill site.

Landfill Ownership - The landfill and related facilities, such as transfer stations, should be owned and controlled by the public. Therefore, UCRRA shall:

for the recovery of ferrous metal in a material recovery facility. Therefore, these portions of the facilities expenses must now be financed with taxable debt.

7.7.4 LEVERAGED LEASING

Leveraged leasing is a financing alternative rather than a financing instrument like bonds. In leveraged leasing, the intent is to finance the project so that the project participants will gain either tax benefits or lower financing costs. These benefits are realized when equity investor funds are leveraged by a "passive" third party investor who then leases the facility to the user or operator. This financing alternative can be successfully utilized when the user or operator cannot obtain the full tax benefits of facility ownership. Therefore, the involvement of a third party, to provide the equity contribution and lease back the facility, can provide lower financing costs for the community.

7.7.5 PRIVATE EQUITY

Private equity is another financing alternative available for solid waste disposal facilities. Private equity involves capital contribution from the facility developer or third parties such as commercial banks, insurance companies, and private investors. This alternative is restricted to privately owned facilities.

In a private ownership structure, private equity as some percentage of the capital construction cost is invested by the developer or possibly a third party. This contribution can be made up front during the construction phase as a lump sum or spread out over a fixed term in installments. The lump sum method has the advantage of lowering the required bond size while the installment method has the advantage of subsidizing tipping fees during that term.

The private equity contributed by investors allows the developer to own the facility for tax purposes. The owner's rate of return is generated from a share of the project energy and/or materials recovery revenue, any management fees, and the attainment of tax benefits as owner of the facility.

The Tax Reform Act of 1986 has significantly reduced the attractiveness of private equity as a financing source for solid waste disposal facilities. Examples of significant changes include the elimination of the 10 percent investment tax credit, doubling of the depreciation schedule for both real and personal property from 5 to 10 years, and the reduction of the use of tax-exempt debt for facilities.

- Private sector C&D recycling and Municipal Solid Waste Composting facilities are being considered.

UCRRA maintains that only a single Part 360 State-of-the-Art landfill is needed. The advantages and disadvantages of a single landfill 100 acres in size vs. multiple smaller landfills were identified and evaluated. (See Table 6-1 below.) Also, in response to public comment, UCRRA conducted a study of economic impacts of developing multiple landfill sites vs. a single site. For a detailed discussion of the advantages and disadvantages of a single landfill compared to multiple landfills, the reader is referred to:

a) DGEIS, Volume I, Section 7.0
b) Final Response Document, Section 3.7
c) Supplemental DGEIS, Section 3.0
d) Supplemental DGEIS, Appendices A-E
e) Supplemental Response Document, Section 3.0

The purpose of the economic impact study was to determine whether or not it was cheaper to develop multiple landfill sites because of perceived savings in transportation costs. The study concluded that the estimated total disposal costs (capital, operations, and maintenance) for a single landfill site were far less than that of multiple sites despite some savings in transportation costs.

When the advantages and disadvantages were evaluated in conjunction with State policy, which calls for the closing of landfills which are polluting the environment and replacing them with state-of-the-art landfills where necessary, it was recommended that a single landfill facility properly sited, designed, engineered, and located near an adequate transportation network is the most environmentally sound and economic disposal alternative for the County.

above constraints, are located in close proximity to each other, and the Gardiner landfill has very poor access. Opposition to the use of Gardiner landfill site clearly indicates that proposals to use existing landfills (or areas adjacent to them) will also engender significant public controversy. Therefore, no savings in legal or permitting costs is likely if the existing landfill alternative was pursued.

(**Modification Added 8/92)

While use of existing landfills is not feasible for the long-term solid waste disposal solution, selection of the most environmentally sound landfills would provide temporary disposal capacity during interim period while the Agency is designing, permitting, siting, and constructing the single Countywide Part-360 landfill.

By implementing a Landfill Consolidation Plan and operating three existing municipal landfills, the Agency would be able to provide sufficient disposal capacity for a period of 3-5 years. These consolidation landfills would be selected after analysis in the Landfill Consolidation Plan. Agreements would be negotiated with the municipalities which presently own them, and the Agency would enter into revised NYSDEC consent orders to operate and close the facilities.

The remaining landfills would be closed under existing Orders on Consent in an orderly fashion and solid waste from those municipalities would be sent to the Consolidation Landfills most convenient to the municipality. A Landfill Closure Assistance Program would be developed and funded to assist municipalities in closing existing facilities and, hopefully, would expedite closure.

When the single, new Countywide Part-360 landfill is operational, the Consolidation Landfills would be closed.

6.4 SINGLE VS. MULTIPLE LANDFILLS

Initially, UCRRA considered co-locating all of its solid waste management facilities (i.e. Recycling center, composting site, and landfill site, etc.) at one location. UCRRA is no longer considering the co-location of all facilities in one place and has begun a program of diversification, (for example):

- Two recycling centers - one in the Town of New Paltz and one in the City of Kingston are being considered;
- Each municipality is developing local Municipal Recycling Drop-Off Sites (MRDS);
- Each municipality has been asked to establish a local yard waste composting site;
- A system of garbage transfer stations around the County are to be established; and

- o Reflecting uneven site topography and constraints imposed by the existing site boundaries, the resultant landfill footprints would not be the most efficient. Therefore, landfill heights and footprint areas would appear to be greater than those required at new sites;

- o Due to steep slopes, mature woods, streams, and near-surface bedrock and groundwater, the existing sites would require more extensive site modifications prior to development than the generic type sites;

- o The projected capital cost to develop the existing landfill sites vs. a single, generic site ($102.7 million vs. $98.1 million under Scenario 2, See Supplemental Draft GEIS, Appendix A), indicates that use of the existing sites represents a much more capital intensive option than utilizing a single, generic site. Furthermore, the annual operations and maintenance landfill(s) cost estimate for the existing sites vs. a single, generic site ($2.5 million vs. $1.6 million under Scenario 1 and $2.7 million vs $1.7 million under Scenario 2, See Supplemental Draft GEIS, Appendix A), also indicates that utilizing the existing operating landfill sites would be a more capital intensive option, based on operating requirements.

It was also found that sufficient acreage could be made available only if the existing Gardiner and New Paltz landfill sites could be used together for construction of new landfills, and the existing Esopus landfill site could be used for recycling and composting facilities. It was recommended that these sites would not represent the most appropriate option for the County because of:

- The potential of site contamination at the unlined landfill facilities;

- Poor existing site topography and constraints;

- Inefficient existing landfill footprints requiring greater landfill heights and footprint areas;

- Steep slopes, mature woods, streams and near surface bedrock and groundwater at the existing sites;

- Greater capital costs to develop existing landfill sites vs. a properly sited single site; and

- Greater operating costs than a single landfill.
  (See Supplemental Draft GEIS, pages 4-17 and 4-18)

Furthermore, the two landfills (Gardiner and New Paltz) that could provide sufficient capacity together, even with the

term solid waste management alternative for the County because of potential economic impacts, issues of leachate quantity and quality, the potential for encountering hazardous waste, the marketability of various mined materials and use of mined materials, and operating risks which could be substantial.

6.3.2 USE OF EXISTING LANDFILLS

The use of existing landfills as an alternative to construction of a new landfill facility was assessed in the earlier technology evaluation and was found not to be a viable alternative. In response to public comment received during the public hearings, UCRRA initiated a more detailed supplemental study on this issue. Results of this study indicated that this alternative would not be an environmentally sound or economically viable option for the County for the following reasons:

- o No one existing landfill in the County could be developed as an alternative to a new landfill since one or more of the following factors impacts each of the County's existing landfills:
  - They lack sufficient capacity to handle the problem on any one site;
  - They are not located on acceptable soils;
  - They have disclosed and undisclosed environmental problems;
  - Many are not strategically located within the County;
  - None meet existing siting or design requirements of 6 NYCRR Part 360 regulations; and
  - Many have access problems;
- o All are under NYSDEC consent orders to close or upgrade. The existing landfills are under consent orders of the NYSDEC to close or be upgraded to comply with 6 NYCRR Part 360 regulations. Testing to determine which alternative will be undertaken by the community is currently underway at all sites. To date, no community has determined to upgrade any existing landfill, as the costs would be prohibitive;
- o Site investigation programs for the NYSDEC have not been completed for these sites, therefore the potential for existing site contamination has not yet been established nor the potential effect of contamination on acreage available for further development;

Landfill Reclamation - Finally, the proposed technology of landfill reclamation through mining of existing municipal solid waste landfills was studied. The study concludes that landfill mining is an emerging technology which is not sufficiently developed at this point in time to be recommended as a long-term solid waste management alternative in Ulster County. Potential economic impacts, risks of operation, and the need for an alternative disposal site once non-recyclable materials are excavated from a landfill, lead to the conclusion that development of landfill reclamation as the main disposal technology for Ulster County is not feasible at this time.

Following is a summary of the results and conclusions that were drawn. For a detailed discussion of the analysis made on each option, the reader is referred to:

a) DGEIS, Volume II, Appendix C
b) DGEIS, Volume I, Section 7.4.5
c) Final DGEIS, Response Document, Section 3.6
d) Supplemental DGEIS, Sections 4.0 and 5.0
e) Supplemental DGEIS, Appendix B-E
f) Findings Statement, Sections 3.2 and 3.4

6.3 LANDFILL TECHNOLOGY OPTIONS

After the technology evaluation, which led to the recommendation of landfilling with aggressive recycling as the preferred solid waste disposal technology, and in response to public comments received during public hearings, UCRRA initiated a series of supplemental studies designed to determine which landfill technology would be the most environmentally sound and cost effective. Through these supplemental studies, UCRRA compared three options to each other:

- **Reclaiming Existing Landfills**
- **Use of Existing Landfills**
- **New Capacity Landfill(s)**

6.3.1 RECLAIMING EXISTING LANDFILLS

In response to public comment on this issue, UCRRA prepared a study on landfill reclamation. It was found that the technology for reclamation of existing landfills is in a developmental stage in certain parts of the United States and is in a research and development stage in New York State. Consequently, it is not presently available as a practical, economical, and environmentally sound means to expand capacity at existing landfills as a countywide solid waste disposal solution.

The study does not recommend landfill reclamation as long-

that the cost savings in transportation do not make the multiple site scenario more economic when taking into account the additional construction and operating costs incurred by developing multiple as opposed to single sites.

Use of Existing Landfill - An extensive study of existing landfills in Ulster County was undertaken in this work. The 15 operating municipal landfills in Ulster County were studied to determine if sufficient acreage would be available for the construction of new landfills and recycling and composting operations. It was determined that sufficient acreage could be made available at the Gardiner and New Paltz landfill sites for construction of new landfills, and that potentially suitable acreage for recycling and composting could be available at the Esopus landfill site. However, it was further recommended that development of facilities at these sites would not represent the most appropriate option for the County because site investigation programs for closure of the landfills have not yet been completed and there is potential of site contamination as these landfill facilities are unlined. Furthermore, because of existing site topography and constraints, the existing landfill footprints were not the most efficient, therefore resulting in landfill heights and footprint areas that would be greater than required at a new site. Steep slopes, mature woods,streams, near surface bedrock area, and groundwater at the existing sites would require more extensive site modifications than at a new properly sited facility. Finally, the capital cost to develop the existing landfill sites verses a single site were far greater, as was the annual operating cost. The study concludes that the most appropriate approach on both an environmental and economical basis would be for the County to develop a single landfill site.

(**Modification Added 8/92)

However, the Agency has reviewed the use of the most environmentally sound existing landfills during the interim period and until such time as the new, Countywide Part-360 landfill becomes operational. This use of up to three existing landfills under revised NYSDEC orders on consent would permit the Agency to manage the solid waste stream in a coordinated efficient, environmentally sound and economical manner during this period. Use of the existing landfills would be restricted to the existing footprint. No expansion would be allowed by NYSDEC, since sufficient capacity does not exist. Existing landfills not to be used will be closed pursuant to a Landfill Consolidation Plan to be developed by the Agency in consultation with NYSDEC and the County Health Department. The Agency could expedite closure by providing funds, raised through issuance of revenue bonds to assist municipalities in closing landfills.

Management Plans. Appendix B of the DGEIS and various sections of this document describe UCRRA's compliance with 6 NYCRR Part 360 Plan content requirements.

*Modification Added 8/92)

It is the intention of the Agency to take control of the Solid Waste stream during the interim period. After the passage of waste stream control legislation by the County Legislature, the Agency will develop a Landfill Consolidation Plan which will provide for the coordinated closure of existing landfills and the use of three municipal landfills during the interim period. The landfills will be operated by the Agency pursuant to revised NYSDEC consent orders until permanent facilities are constructed. Interim Satellite Aggregation Centers will be established to handle recyclable materials until permanent facilities are constructed. As more fully described in Chapter 9.0, the countywide recycling programs are scheduled to be implemented on a "fast track" basis and, accordingly, should address a portion of the waste stream, prior to the County's entire solid waste management program becoming fully operational (ie., prior to operation of a Countywide landfill).

The development of a solid waste management program for the County requires an extensive planning process that covers issues that are important to all residents. These issues include implementing a viable Countywide recycling program, selecting a waste disposal technology, identifying a site(s) suitable for waste processing and/or disposal, and implementing the financial and legislative components of the solid waste management program. It is also the goal of this Plan to review the environmental, social, and economic impacts of the comprehensive solid waste management plan for the County.

NYS SOLID WASTE PRIORITIES

1. **Reduce the Amount of Solid Waste Generated**
2. **Reuse & Recycle Materials to the Maximum Extent Practical**
3. **Waste-to-Energy Systems**
4. **Landfills**

The State's top priority is to maximize, to the extent economically and technically practical, waste reduction, recycling, and reuse efforts. This is the County's top priority as well. The State won't issue permits for facilities such as landfills until a County can satisfactorily demonstrate its commitment to recycling. The third priority is using waste-to-energy plants. The fourth priority is given to landfills.

The State's policy is to reduce the dependence on landfilling by developing an integrated solid waste management program. The State's goal is to close landfills which are polluting the environment and replace them where necessary, and only after consideration of preferred solid waste management hierarchy, with state-of-the-art landfills.

The State encourages decreased dependence on landfilling and has set new, stringent environmental standards for landfill construction, including a liner system of two synthetic and two clay liners with a backup method for capturing the contaminated water called "leachate".

In addition, State policy further specifies that Solid Waste Planning Units, such as counties, must contribute to Solid Waste Management by providing programs which promote waste reduction and recycling. The State's policy for Solid Waste Management has been addressed in the Final GEIS and in the Integrated Solid Waste Management Plan presented in Chapter 9.0 of this document. It demonstrates that the County fully supports the institution of waste reductions measures. In conjunction with waste reduction measures, the development and implementation of aggressive recycling programs are targeted to maximize recycling to the greatest extent technically and economically practical. This should bring Ulster County beyond the State goal of 50 percent reduction/recycling/composting of the waste stream by 1997.

The Solid Waste Management Act of 1988 also identifies areas that should be addressed in local Solid Waste

Many of the counties in the Mid-Hudson Valley Region are at various stages of developing and implementing solid waste management programs. Like Ulster County, these counties are faced with stricter waste disposal regulations, and limited remaining disposal capacities.

Although the development of a cooperative regional waste disposal plan has merit, these efforts have not been historically successful in the absence of a central governing authority responsible for implementation of the project. Some of the risks the County may face if it participated in a regional waste disposal plan include extending the implementation schedule beyond a time-frame acceptable to the County; having to bear such consequences as implementation costs should the other county(ies) lose interest in the project; and forfeiting control over sensitive project issues. Some of the project issues that the County may lose control of by entering a regional plan include site and technology selection, establishment of disposal fees, and exclusion of Ulster County municipalities from disposal at the regional facility (ies).

Current landfilling practices, along with the present recycling effort, cannot continue as the primary means of solid waste management since these landfills are under NYSDEC consent orders to close or be upgraded to meet environmental regulations in the immediate future (upgrading is generally preluded by the cost of compliance with current regulations).

**Modification Added 8/92)

Selected existing landfill will only be used on a temporary basis for disposal of Solid Waste until permanent facilities are constructed. Present recycling efforts will not attain the State goal. Direct implementation of a waste disposal facility would circumvent prudent planning efforts and fall short of SEQRA requirements. It is doubtful that an agreement with a privately owned and operated facility would provide the County with the necessary security that the solid waste services would be provided at a justified cost over the planning period. Although the multi-county alternative may be a consideration in the future, the currently required time-frame and inherent risks to the County are prohibitive. It is, therefore, in the best interest of the County to develop the "Plan".

1.4 THE STATE'S PRIORITIES:

The Solid Waste Management Act of 1988 establishes the State's policies and strategy for managing solid waste and includes a State Solid Waste Management Priorities or "hierarchy" as follows:

Following is a summary of the alternative actions that were evaluated and rejected. For detailed discussion of these actions, the reader is referred to:

a) DGEIS, Sections 2.0 and 3.0
b) Findings Statement, Sections 1.0, 3.2, and 3.4

NO ACTION: In facing a project this costly, some people would say there's another option: "Do nothing." But that does not provide a long-term solution. It would delay decisions that would have to be made eventually in facing this problem and would add to the costs. If Ulster County supported the do-nothing approach, then it should be realized that this eventually would be more costly. Local municipalities would continue to be responsible for their solid waste and landfilling at the existing municipal landfills would probably continue, at least initially, as the primary means of waste disposal.

IMMEDIATE IMPLEMENTATION ALTERNATIVE: The County could forego program planning and move directly to the acquisition of a site(s), selection of a technology(s), procurement of vendor services, and construction of solid waste management facilities. Direct implementation of a waste disposal facility would not meet the requirements of SEQRA, nor would it ensure the development of an environmentally sound waste disposal facility. Furthermore, it would not meet the requirements of the Solid Waste Management Act of 1988. The immediate implementation alternative is not a feasible alternative to the development of a solid waste management program.

RELIANCE ON THE PRIVATE SECTOR: This alternative would involve entering into an agreement with a private company for disposal or processing of solid waste either in another County or State, or within Ulster County. However, private sector contracts are not a reliable, risk-free alternative. First, no existing private facility with adequate capacity exists within the region. The Al Turi landfill in Orange County has a present site life of approximately 5 years. Transportation costs to the landfill would be extremely high, and when added to the burden of administering the transportation of solid waste over long distances, the conclusion is that this is not a viable alternative.

MULTI-COUNTY ALTERNATIVES: This alternative would involve the planning and development of a regional solid waste management program for Ulster County and neighboring counties in the region.

1988 Solid Waste Quantities

A number of methods were used to estimate the quantity of solid waste generated in the County in 1988. These included field programs, contact with solid waste generators and haulers, and contact with State and local agencies and municipal representatives. Based on these methods, the estimated 1988 solid waste generation rate for the County is 645 tons per day (tpd) or 7.8 pounds per capita per day (pcd). Although this estimate may appear high, the Ulster County solid waste stream includes a number of components that are not typically included in solid waste stream estimates, such as sludges, offal, and pomace. The 1988 generation rate for components of the County's solid waste stream are as outlined in Figure ES-6 and ES-7 below:

FIGURE ES-6

Solid Waste Stream Component	1988 Waste Generation Rate (tpd)
Residential Waste	227
Commercial Waste	157
Non-Hazardous Industrial Waste	55
Apple Pomace	30
Grape Pomace	2
Construction and Demolition Debris	55
Sewage Plant Sludge	33
Leaves and Yard Waste	70
Water Plant Sludge	0
Air Pollution Control Facility Sludge	0
Offal	4
Incinerator Residue	0
Tires	5
Waste Oil	7
Contained Gaseous Material	0
Power Plant Ash	0
	645 tpd

1988 Solid Waste Composition

Estimates of the composition of the commercial and residential waste in the County are necessary for the development of the recycling program. To estimate the

- Multi-County Alternatives - This alternative would involve the planning and development of a regional solid waste management program for Ulster County and neighboring counties in the region.

Current landfilling practices, along with the present recycling efforts, cannot continue as the primary means of solid waste management since these landfills are under NYSDEC consent orders to close or be upgraded to meet environmental regulations in the immediate future (upgrading is generally precluded by the cost of compliance with current regulations). (**Modification Added 8/92) **Existing landfills will be closed under a Landfill Closure Schedule developed by NYSDEC in accordance with conditions contained in the Orders on Consent. Many will close in the near future, and a few will be used to handle the Solid Waste stream until permanent facilities are constructed.** Present recycling efforts will not result in acceptable recycling levels. Direct implementation of a waste disposal facility would circumvent prudent planning efforts and fall short of SEQRA requirements. It is doubtful that an agreement with a privately owned and operated facility would provide the County with the necessary security that the solid waste services would be provided at justified cost over the planning period. Although the multi-county alternative may be a consideration in the future, currently required time frame and inherent risks to the County are prohibitive. It is, therefore, in the best interest of the County to develop and implement "The Plan".

SOLID WASTE STREAM ANALYSIS

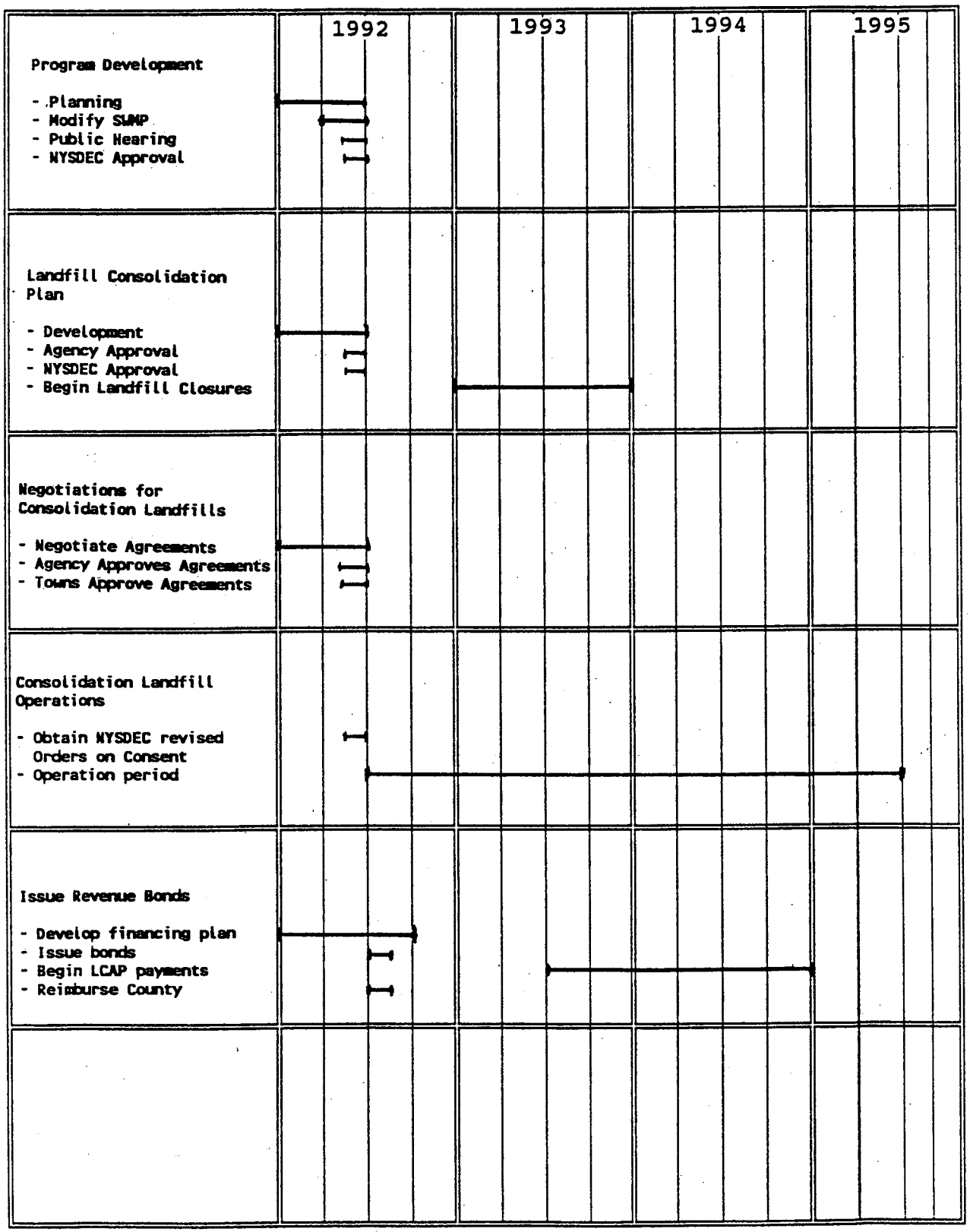
One of the major components in developing "The Plan" is an analysis of the solid waste stream in terms of current and projected quantities and composition. This information is used to estimate the potential impacts of recycling, reuse, and waste reduction on the projected waste stream, and for sizing solid waste management facilities.

Sixteen solid waste components are discussed in "The Plan":

- Residential Waste
- Commercial Waste
- Non-Hazardous Industrial Waste
- Apple Pomace
- Grape Pomace
- Construction and Demolition Debris
- Sewage Plant Sludge
- Leaves and Yard Waste
- Water Plant Sludge
- Air Pollution Control Facility Sludge
- Offal
- Incinerator Residue
- Tires
- Waste Oil
- Contained Gaseous Material
- Power Plant Ash

(**Modification
Added 8/92)

FIGURE ES - 5 (con't)
IMPLEMENTATION SCHEDULE FOR
LANDFILL CONSOLIDATION PLAN (1992-1995)



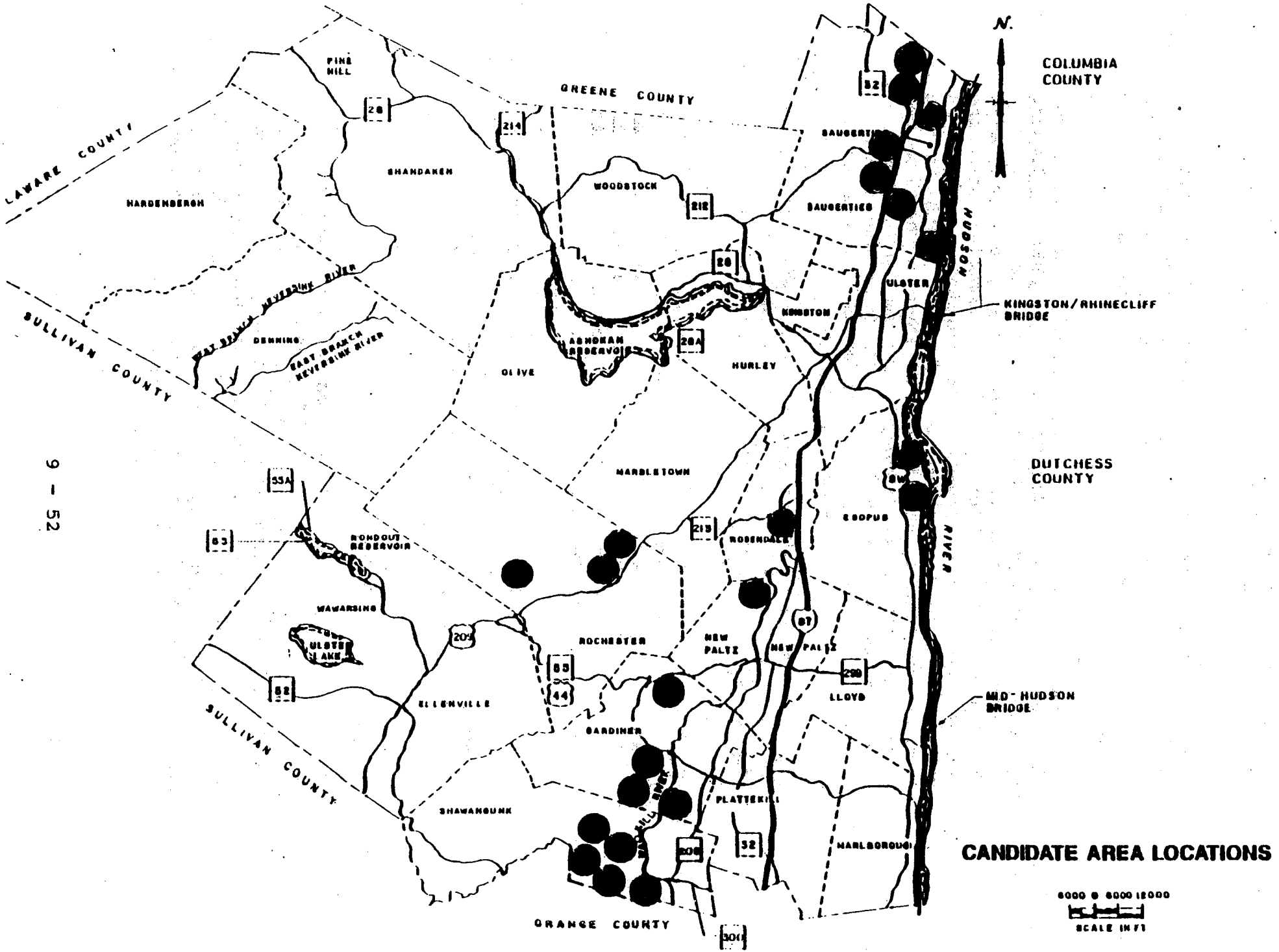

N.
COLUMBIA COUNTY
DUTCHESS COUNTY
GREENE COUNTY
ULSTER COUNTY
SULLIVAN COUNTY
SULLIVAN COUNTY
ORANGE COUNTY
DELAWARE COUNTY
HUDSON RIVER
KINGSTON/RHINECLIFF BRIDGE
MID-HUDSON BRIDGE
FINE HILL
SHANDAKEN
HARDENBERGH
WOODSTOCK
SAUGERTIES
KINGSTON
ULSTER
DENNING
WEST BRANCH NEVERSINK RIVER
EAST BRANCH NEVERSINK RIVER
ASHOKAN RESERVOIR
OLIVE
HURLEY
MARBLETOWN
ESOPUS
ROSENDALE
RONDOUT RESERVOIR
WAWARSING
ULSTER LAKE
ROCHESTER
NEW PALTZ
LLOYD
ELLENVILLE
GARDINER
SHAWANGUNK
PLATTEKILL
MARLBOROUGH
CANDIDATE AREA LOCATIONS
6000 0 6000 12000
SCALE IN FT

FIGURE 9-2

to fund the work to date. The County Legislature has further appropriated funds in its annual budgets to pay for the operating expenses of the Agency.

"The Plan" provides for the funding of the component projects through the issuance of solid waste management revenue bonds. Once the bonds are issued, funds advanced by the County Legislature will be reimbursed.

(**Modification Added 8/92)

The Agency projects that future capital expenditures for **the Landfill Consolidation Plan, Landfill Closure Assistance Program,** constructing the landfill, SAC buildings, and a composting facility will be necessary. The Agency will develop, after consultation with its counsel and senior managing underwriter, a detailed financing plan and schedule. As set forth in the findings statement, this plan will involve the issuance of revenue bonds by the Agency as opposed to the issuance of general obligation debt by the County. Thus, the cost of the facilities will be borne by the assets of the facilities and not the general taxpayers.

Figure 9-3 depicts the recommended solid waste facilities that will be needed for full plan implementation. Also, listed are estimated capital costs in 1988 dollars for each of the major facilities.

The Agency currently projects that it will be in a position to issue bonds in connection with constructing/permitting two Satellite Aggregation Centers by the Spring of 1992 and for landfill construction by the Spring of 1993. In the meantime, the County Legislature will be requested to appropriate funds to carry the project through the interim phase.

After "Plan" approval, the Agency will prepare and submit to the County Legislature, a proposed 1991 Capital Budget. It will also meet with its financing team and the County representative to develop a specific long-term financing plan and schedule.

9.5 HOST COMMUNITY PROGRAM

Host community programs have been used in other parts of the State and the country in an attempt to minimize the environmental, economic and social impacts associated with solid waste management facilities. The development of such a program for the County would provide a mechanism for the identification of impacts; the negotiation of the steps to be taken to mitigate the impacts, the execution of an enforceable agreement formalizing the results of the negotiations.

SINGLE NEW CAPACITY LANDFILL
IMPLEMENTATION SCHEDULE (1989-1997)

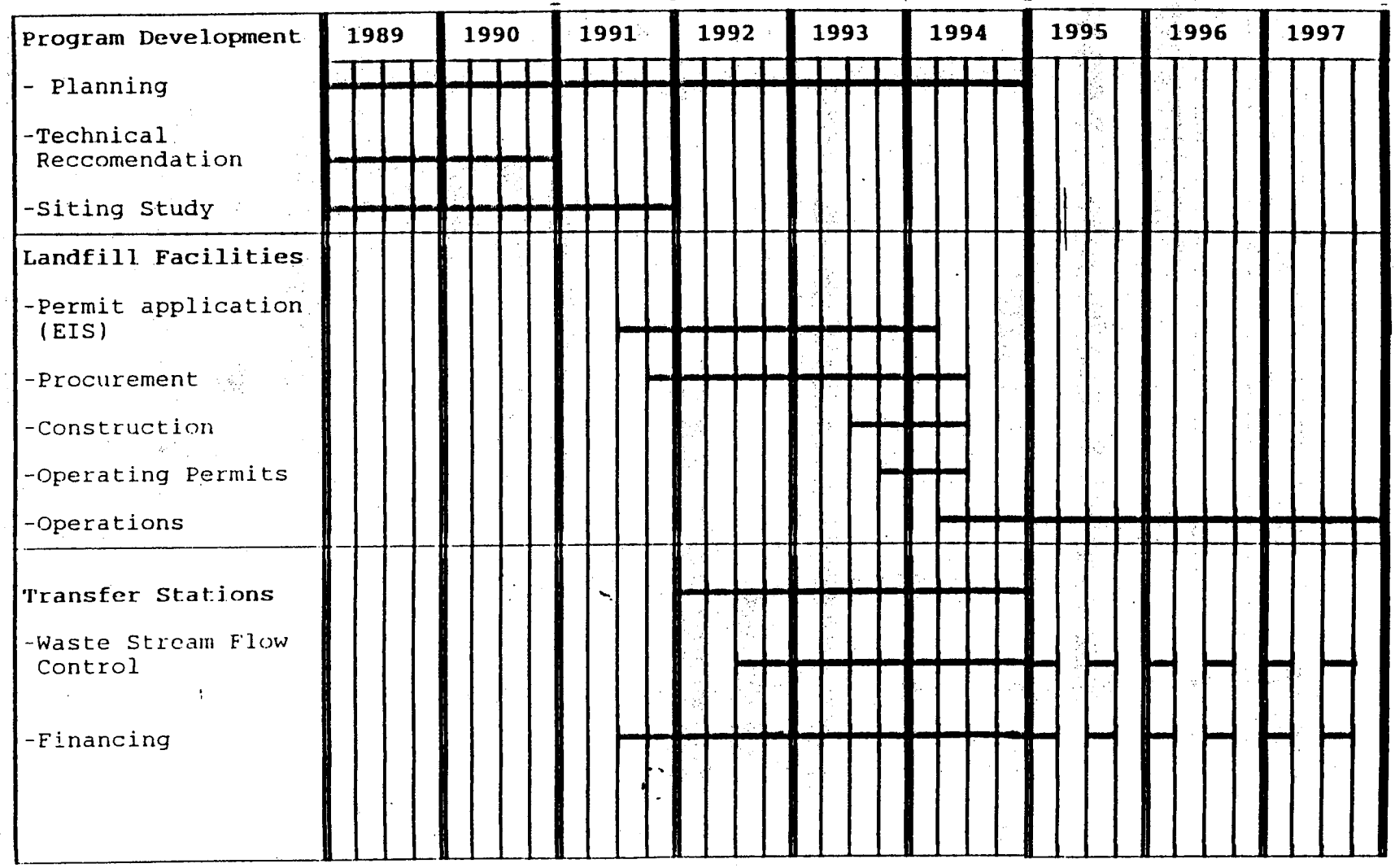
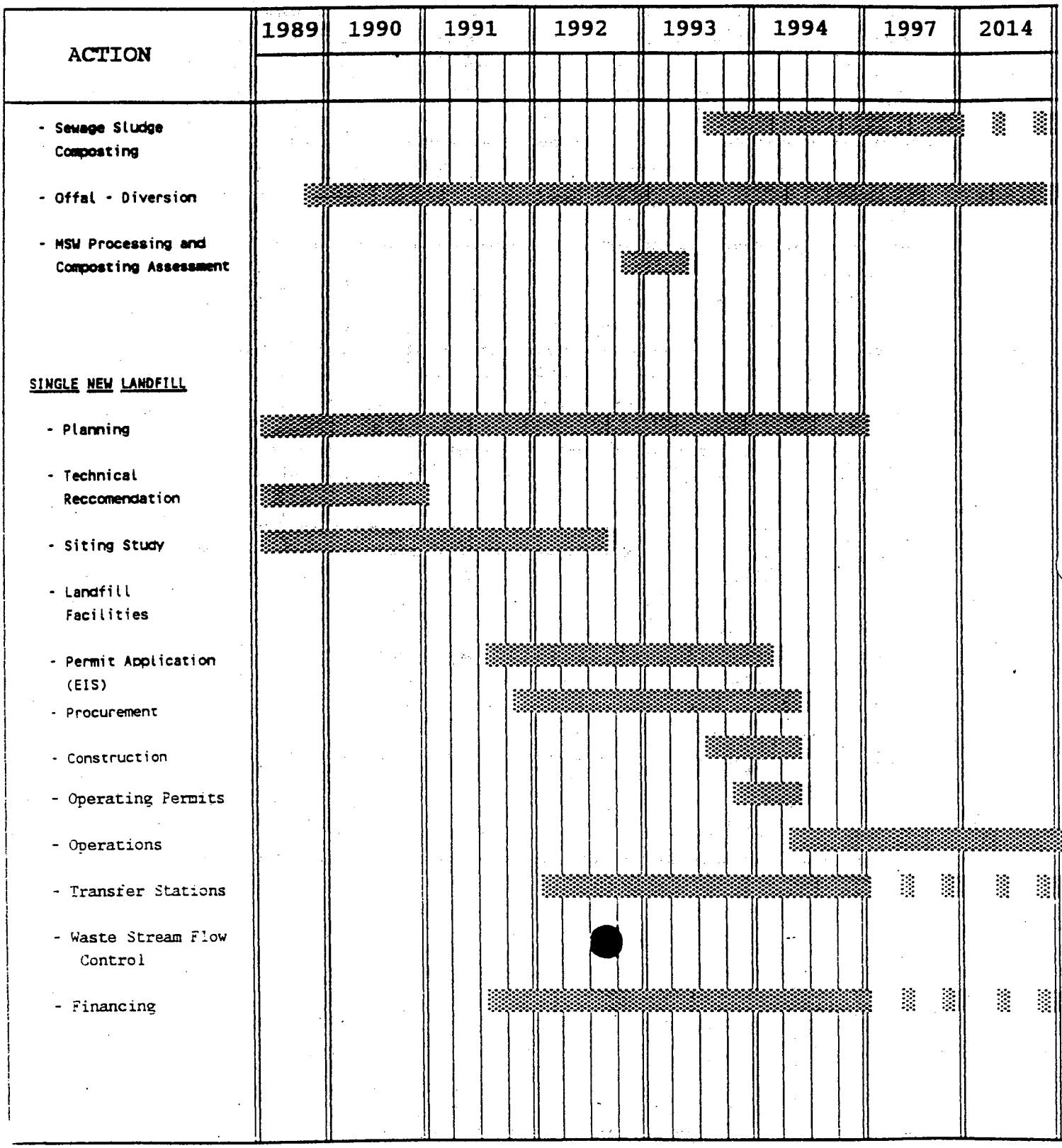


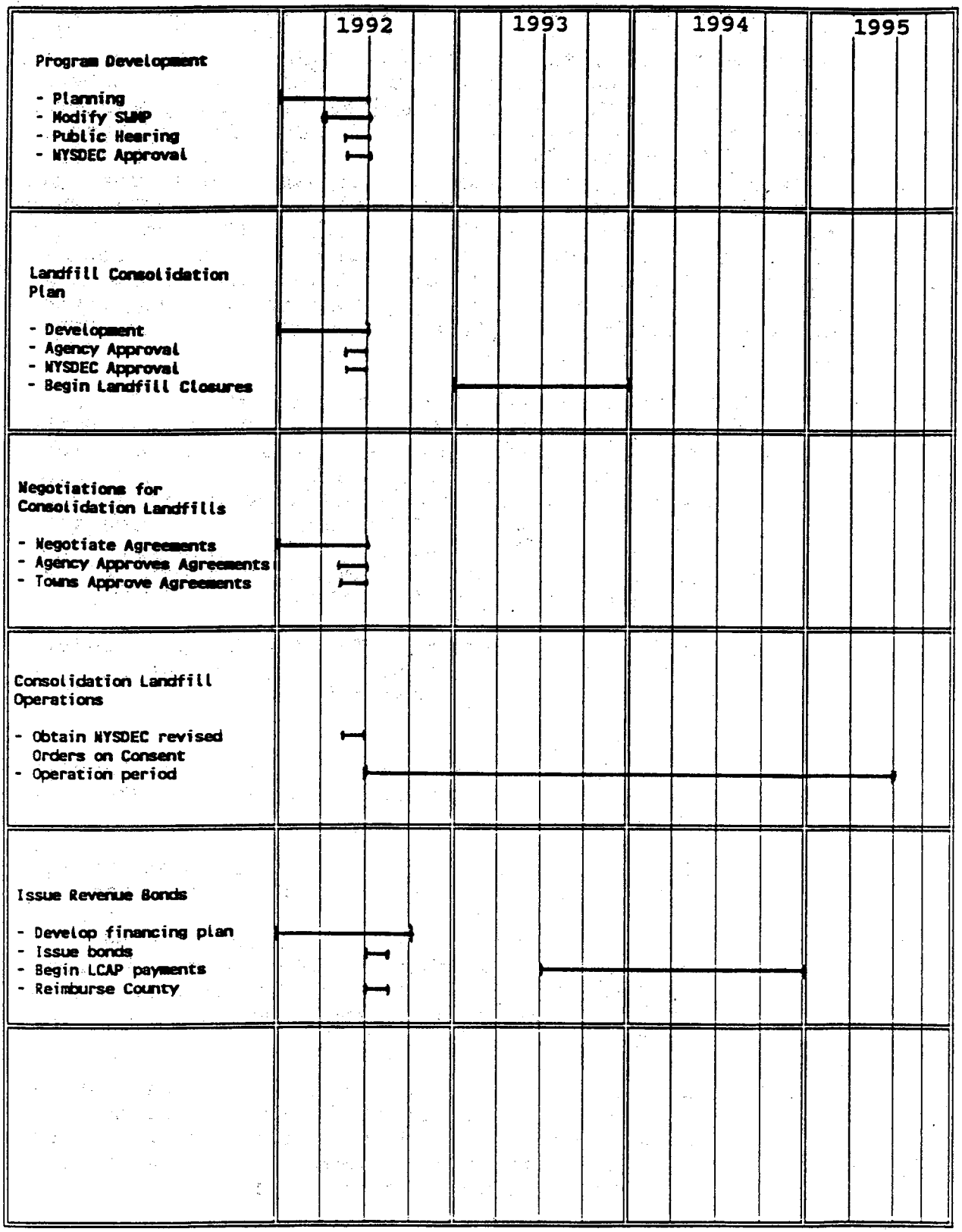
Figure 9-4 (Cont'd)



Action on going

(**Modification Added 8/92)

FIGURE 9 - 4 (con't)
IMPLEMENTATION SCHEDULE FOR LANDFILL CONSOLIDATION PLAN (1992-1995)



9.6 PLAN AMENDMENT & FUTURE ACTIONS

The State Environmental Quality Review Act and the NYS Solid Waste Management Act require that generic environmental impact statements and Solid Waste Management Plan include procedures and criteria for supplements to reflect impacts, such as site specific impacts, which have not been fully addressed or analyzed in the GEIS. SEQRA further requires that such procedures shall include provision for public notice for supplements which will allow for public comment on new material presented by the supplement in the same manner that was provided in respect to the GEIS. [See 6 NYCRR Part 617.15(b).] In the section below, UCRRA establishes procedures to analyze the environmental impacts associated with future actions. These procedures will also be utilized in approving future actions and may be used when amending "The Plan". With this in mind, UCRRA finds and determines the following:

SEQRA Review Required - Specific actions to carry out the policy findings and conclusions set forth in the solid waste management plan and the Final GEIS and Supplemental Final GEIS must be subjected to meaningful public review and must be carried out in accordance with SEQRA and all appropriate permitting regulations. The process for development of future actions should follow the requirements set forth in 6 NYCRR Part 617.15.

Implementation Procedure - The following procedure satisfies SEQRA and permitting requirements and maximizes public involvement in the process:

- Identify proposed future actions and discuss the actions in public session as soon as possible.

- Provide information on the proposed future action to the Citizen's Advisory Committee.

- Analyze proposed future actions using the criteria established in SEQRA and the Final GEIS and Supplemental Final GEIS and report on the need for further study and review under SEQRA.

- If it is determined that no further SEQRA compliance is required in accordance with 6 NYCRR Part 617.15(c), then proceed by adopting, in public session, a resolution implementing the specific action.

- If a proposed future action was adequately addressed in the Final GEIS or Supplemental Final GEIS but was not adequately addressed in this Findings Statement, then proceed by adopting a supplemental Findings Statement.

- If a proposed future action was not adequately addressed in the Final GEIS or Supplemental Final GEIS, then make a determination of significance of the effects of the proposed action.

- If the proposed future action will not result in any significant effects, then prepare and approve a negative declaration.

- If the subsequent proposed action involves one or more significant environmental effects in accordance with the criteria under SEQRA and the Final GEIS and Supplemental Final GEIS, then authorize the preparation of a supplement to the Final GEIS and Supplemental Final GEIS. In such case, publicly advertised scoping sessions shall be utilized to assist UCRRA in developing a work plan for the Supplemental EIS. The Supplemental EIS shall contain a section which considers the proposed future action in light of the Final GEIS and Supplemental Final GEIS and reconciles it to the findings and conclusions set forth in the Final GEIS, the Supplemental Final GEIS, and this Findings Statement. The review shall also relate the proposed action to the solid waste management plan.

The purpose of these procedures is to ensure that future site-specific and program-specific proposed actions based upon the Final GEIS and Supplemental Final GEIS and Solid Waste Management Plan are undertaken only after full consideration of the proposed actions under SEQRA which allows for maximum public involvement.

By discussing the proposed future actions in public sessions at the earliest stages of development, the public will be assured of having adequate notice to begin to analyze proposed future actions. Proposed future actions should be discussed with the Citizens Advisory Committee as soon as possible. Adoption of this implementation methodology may help to avoid adverse environmental impacts by providing the public with early and adequate notice of actions and permitting the public to come forward, and subsequently, in formal scoping sessions to bring to the attention of UCRRA perceived adverse impacts.

There is no identified adverse environmental impact to the process described as it is intended to carry out the provisions of SEQRA and to maximize public involvement.

Alternatives Considered - The no action alternative would allow for the ad hoc review of proposed future actions. This alternative is unacceptable because it defeats the purpose of solid waste management planning and may violate SEQRA. The purpose of developing a comprehensive solid waste management program through the generic environmental impact process is to provide for a coordinated and iterative development of a comprehensive plan. The basic step of establishing the solid waste management plan has been accomplished in this initial process. Each proposed future action to implement the plan must be reviewed in order to ensure that it is in accordance with the plan, or that any variation from the plan is fully reviewed and analyzed. Ad hoc actions would not necessarily relate back to the plan and, thus, the goal of a coordinated, comprehensive development would not be achieved.

By following the process proposed herein, UCRRA will develop the plan in a manner which allows the greatest opportunity for a comprehensive, coordinated effort with meaningful public involvement.

9.7 CONCLUSION

The issuance of this "Plan" represents the culmination of over two and one-half years of work by UCRRA, its staff and consultants, County and public officials, and members of the public. The process represents a significant investment of time and money on everyone's part. But this process is just the beginning. The development of a comprehensive long-term solid waste management plan for the County is an evolutionary process. As the subject matter involved is so important to the future of the County, significant commitments of time and effort should be made by all to the next phase of the work.

UCRRA concludes that the essential policy developed in the "Plan" and Final GEIS and Supplemental Final GEIS represent an action which, after consideration of all reasonable alternatives, will avoid adverse environmental effects to the maximum extent practicable. Development of an integrated solid waste management program with strong emphasis on reduction, reuse, and recycling, composting and landfill technology to be constructed strictly in accordance with 6 NYCRR Part 360 is consistent with social, economic, and other essential considerations as it provides a safe, flexible system which protects the health and safety of the residents of the County and enhances the economic viability of the County.

By maximizing use of the SEQRA and solid waste management planning process, and by encouraging public involvement through the public process, open meetings, the Citizen's Advisory Committee, a host community program and an implementation methodology which complies fully with the letter and spirit of SEQRA, adverse environmental effects of the action will be minimized or avoided and the mitigative measures identified in the Final GEIS and Supplemental Final GEIS will be maximized.

G.O. bonds are secured by a pledge of ad valorem taxes despite the possibility that the bonds may be paid from other sources of unrestricted income like income taxes, sales taxes, and other fees. Therefore, G.O. bonds normally carry the lowest interest rate among available financing sources. G.O. bonds have been used in the U.S. to finance such diverse projects as airports, water and wastewater treatment plants, sports stadiums, and transportation projects. G.O. bonds may continue to be paid by the municipality even after the facility for which they were issued has stopped functioning. The low interest rate is the expected outcome when a municipal entity produces the guarantees to back such an instrument.

In determining whether G.O. bonds are appropriate for financing the County's solid waste disposal facilities, certain considerations should be factored into the evaluation. These factors include, but are not limited to:

- **Current credit rating of the County**
- **Debt ceiling on the issuing body's borrowing capacity**
- **Projected impacts of the financing on the issuing body's credit rating**
- **Availability of other types of financing.**

A major advantage of G.O. bonds is that they are considered among the most secure municipal tax-exempt bonds and, as such, usually involve a comparatively low interest rate. Another major advantage of G.O. bonds is that the issuance of such instruments is one of the least complex forms of debt offerings. Therefore, the potential for delays in the bond offering is reduced and issuance costs should be lower than other forms of bond financing.

The primary disadvantage of G.O. bond financing is the potential to compromise the issuing municipal entity's borrowing capacity for other necessary municipal projects and needs. For that reason, many solid waste projects have utilized other types of financing to avoid utilizing this borrowing capacity.

7.7.2 MUNICIPAL REVENUE BONDS

Municipal Revenue Bonds (revenue bonds) are long-term, tax-exempt obligations that are payable from the project revenues or revenues from other facilities owned by the government of general jurisdiction (such as Ulster County) or a public benefit corporation (such as UCRRA). Revenue bonds are also referred to as project revenue bonds since (unlike G.O. bonds) the success or failure of the project directly affects the ability to repay the debt.

Revenue bonds for a solid waste disposal facility rely on the revenue generated, such as user tipping fees and material and/or energy recovery revenues. Generally, revenue bonds issued by a municipality require a pledge to set and collect rates for use of the facility that equal the operating expenses, bond principal, and interest during the life of the issue.

Interest rates on revenue bonds are usually higher than the interest rate on G.O. bonds since the instrument contains more risk and because repayment depends upon success of the project. Determination of the issue interest rate is a complex process that requires a bond rating agency to review the financial feasibility of the project, the contractual arrangements between the involved parties, and other matters. Because the potential for unforeseen revenue shortfalls is implicit with the increased risk of revenue bonds, such instruments necessitate the formation of a debt service reserve fund as protection against this event.

7.7.3 INDUSTRIAL DEVELOPMENT BONDS

Industrial development bonds (IDBs) represent a specific form of municipal revenue bonds. IDBs are tax-exempt long-term bonds issued by a public benefit corporation acting on behalf of the municipality. The purpose of IDBs is to foster industrial or economic development. This type of financing has been used extensively for solid waste disposal facilities.

The use of IDBs to finance a project results in the project either being leased or sold to a private corporation, or in some instances, the bond proceeds are loaned to a private corporation. Although IDBs have been successfully used for solid waste disposal facility financing, the Federal Tax Reform Act of 1986 (the Act) has significantly changed the use of such an instrument. For example, the Act reduced the tax-exempt IDB allocation for privately owned WTE projects. Therefore, privately owned projects must now compete with all types of industrial development projects for a share of the State's allocation during the year. The allocation limit established in the Act is set at $50 per capita or $150 million per state. Another impact the Act had on IDBs was to restrict tax exempt financing of non-qualifying costs. In certain cases, non-qualifying equipment costs are limited to 5 percent of tax-exempt issuances. Thus, under this "95/5 rule", expenses for the construction or installation of equipment related to the sale of by-products from the facility are not tax-exempt. Examples of non-qualifying equipment include turbine-generator sets for a WTE facility and magnetic separation equipment

Attachment C.

SOLID WASTE MANAGEMENT AGREEMENT BETWEEN UCRRA AND MUNICIPALITIES

Contains:

- Attachment C-1/C-2 - Primary Solid Waste Management Agreements for all Municipalities (Town, City, Villages) with Special Conditions for Towns with Landfills not being used as Consolidation Landfills

- Attachment C-3 - Solid Waste Management Agreement for Towns Whose Landfills will be Used as Consolidation Landfills With Special Conditions Regarding UCRRA Operation of These Landfills

DRAFT
7/8/92

SOLID WASTE MANAGEMENT AGREEMENT

Between

THE ULSTER COUNTY RESOURCE RECOVERY AGENCY

and

THE (T,C,V) OF _____

Dated as of _____, 1992.

SOLID WASTE MANAGEMENT AGREEMENT

SOLID WASTE MANAGEMENT AGREEMENT dated as of _____, 1992 between the ULSTER COUNTY RESOURCE RECOVERY AGENCY, a public benefit corporation duly organized and existing under the laws of the State of New York and having its principal offices at 52 Main Street, UPO Box 4298, Kingston, New York 12401 (the "Agency") and the _____ of _____, a municipal corporation of the State of New York having its principal offices at _____ (the "Town, City, Village"):

W I T N E S S E T H:

WHEREAS, the proper disposal of solid waste generated in or originating in the County of Ulster (the "County") is a serious public concern which must be managed in a cost effective, environmentally sound manner in order to protect the public health, safety and welfare and to prevent a serious financial burden upon County residents; and

WHEREAS, the Ulster County Legislature (the "County Legislature") petitioned the New York State Legislature to create by special act the Agency and empowered the Agency to, among other things, plan, develop, finance, construct, upgrade, renovate, and operate solid waste management facilities; and

WHEREAS, the Agency has been established as the "local

planning unit" as that term is defined in Article 27 of the Environmental Conservation Law and "lead agency" as that term is defined in Article 8 of the Environmental Conservation Law and 6 NYCRR Part 316 (collectively "SEQRA") to prepare a comprehensive solid waste management plan (the "Plan"), and conduct a review thereof pursuant to SEQRA, which Plan includes the following initiatives: implementation of a County-wide solid waste reduction, reuse and recycling plan; selection of solid waste disposal technologies; and implementation of host community benefit programs for municipalities effected by Agency-owned facilities; and

WHEREAS, a final generic environmental impact statement and supplemental final generic impact statement were duly authorized, undertaken, completed and filed; and

WHEREAS, the Agency, the County, and the New York State Department of Environmental Conservation ("NYSDEC") have approved a plan and adopted findings in connection with the final GEIS and supplemental final GEIS thereon; and

WHEREAS, the Plan provides for a comprehensive program to manage solid waste in the County for the next 20 years; and,

WHEREAS, in support of the Agency's implementation of the Plan, the County Legislature has adopted and approved Local Law No. 8 - 1991, the Mandatory Source Separation and Recycling Law and Local Law No. 9 - 1991 Solid Waste Management Law, and has approved a Solid Waste Service Agreement between the County and the Agency which provides for the terms and conditions of the Agency's

assumption of responsibility for management of the County's solid waste, and for the payment by the County of "net service fees" in consideration of the Agency's providing solid waste management services as defined therein.

WHEREAS, the (T,C,V) and the Agency desire to establish the terms and conditions pursuant to which the Agency shall provide for management and disposal of solid waste generated in the (T,C,V) and assume responsibility for processing and marketing of Regulated Recyclable Materials generated in the (T,C,V); and

WHEREAS, it is the purpose of this Agreement to establish a contractual relationship for solid waste management between the Agency and the (T,C,V) to ensure (i) a coordinated transition of responsibility for solid waste management from the (T,V,C) to the Agency; (ii) the provision by the Agency of solid waste management services for the (T,C,V) during the term of this Agreement; and (iii) that ^ all solid waste and Regulated Recyclable Materials generated in the Town will be provided to the Agency;

NOW, THEREFORE, the Agency and the (T,C,V) in consideration of the premises and the respective representations and agreements hereinafter contained and other good and valuable considerations, receipt of which is hereby acknowledged, agree as follows:

Section 1. Definitions

For the purpose of this Agreement, the following words and terms shall have the respective meanings set forth below, unless the context otherwise requires:

"Act" means Article 13-G of the Public Authorities Law of the State.

"Agency" means Ulster County Resource Recovery Agency, a corporate governmental agency constituting a public benefit corporation of the State duly organized and existing under the laws of the State, and any body, board, authority, agency or other political subdivision of the State which shall hereafter succeed to the powers, duties and functions of the Agency.

"Agreement" means this Solid Waste Management Agreement and any supplements and amendments hereto made in conformity with the terms hereof.

"County" means the county of Ulster, State of New York.

"Effective Date" means the date service is first provided hereunder by the Agency.

"Regulated Recyclable Materials" means newspaper, color-separated glass bottles and jars, metal cans, plastic bottles and jugs, corrugated cardboard and any other materials as may be designated by the Agency in accordance with Local Law No. 8 of 1991.

"Solid Waste" means all materials or substances discarded or rejected within the (T,C,V) as being spent, useless, worthless, or in excess to the owners at the time of such discard or rejection, including, but not limited to garbage, refuse, industrial and commercial waste, sludges from air or water pollution control facilities or water supply treatment facilities, rubbish, ashes, contained gaseous material, incinerator residue,

demolition and construction debris and offal, but not including sewage and other highly diluted water-carried materials or substances and those in gaseous form, source, special nuclear or by-product material within the meaning of the United States Atomic Energy Act of 1954, as amended, waste which appears on the list of hazardous waste promulgated by the Commissioner of Environmental Conservation pursuant to Section 27-0903 of the Environmental Conservation Law of the State of New York, and scrap or other material of value separated from the waste stream and held for purposes of materials recycling, as such definition may be amended from time to time by the State.

"Solid Waste Flow Control Laws" means the provisions of Local Law No. 8 of 1991 and Local Law No. 9 of 1991 which respectively require the delivery of Regulated Recyclable Materials and the disposal of Solid Waste at designated facilities.

"Solid Waste Management Plan" means the plan for management of Solid Waste in the County approved by the State Department of Environmental Conservation on December 3, 1991, as amended from time to time pursuant to law.

"State" means the State of New York.

"System" means collectively all elements of any sites containing the facilities constructed or obtained by the Agency to carry out the purposes of this Agreement, including Interim Satellite Aggregation Centers for the processing of Regulated Recyclable Materials and interim landfills to be obtained pursuant to law and agreement with the municipalities owning such landfills,

and the facilities identified in the Solid Waste Management Plan, alternate disposal sites, and equipment acquired by the Agency except that the term System shall not include any incinerator or waste-to-energy facility.

"Town, City, Village" means the of .

Section 2. Provision of the System by the Agency

The Agency will cause the planning, design, acquisition, construction, renovation, completion and operation of the System in accordance with the Solid Waste Management Plan. The Agency shall cause the costs of planning, designing, acquiring, constructing, renovating, equipping and completing the System to be financed through the issuance of revenue bonds. Any revenue bonds issued by the Agency shall not constitute a debt of the State, County or (T,C,V) and neither the State, County or (T,C,V) shall be liable thereon.

All facilities of the System will be planned, designed, acquired, equipped, completed and operated so as to meet all applicable permit conditions and environmental requirements. The (T,C,V) shall have no obligation to pay for any of the facilities set forth in this section, except as otherwise provided in Section 6 of the Agreement.

The parties acknowledge that the Agency and the County have entered into an agreement (the "Solid Waste Service Agreement") whereby the **Agency** agrees to provide or cause to be provided to the facilities of the System **for the management of**

Solid Waste and Regulated Recyclable Materials generated in or coming into the County. The Agency agrees to provide and operate the System and accept Solid Waste and regulated recyclable Materials at the facilities of the System. In consideration of this service, the County will pay, if required, **and upon the effective date of the Solid Waste Service Agreement,** "Net Service Fees" as defined in the Solid Waste Service Agreement.

Section 3. The Agency's Service Obligations

During the term of this Agreement, the Agency will provide, or cause to be provided, through the System, the service of accepting, processing and/or disposing of Solid Waste and accepting, processing, and marketing of Regulated Recyclable Materials.

Section 4. The Agency's Fees and Charges

The Agency shall establish and from time to time amend such fees and charges as it deems necessary and proper to pay for the costs of the System and providing the service under this Agreement, including a tipping fee at the Agency's facilities. The tipping fee shall be established on an annual basis. The Agency shall announce the proposed annual tipping fee for the next year by September 10th of each year. The Agency shall notify the Town in writing and shall schedule a hearing on the fee upon 15 days written notice to the Town. The Agency shall establish the tipping fee no later than October 15th of each year. The Agency agrees

that the tipping fee to be charged for the first year of operation shall not exceed $ per ton. ^ The Agency shall not increase the annual tipping fee charged the Town during the fiscal year, unless such increase is required by unforeseen increases in expenses relating to payment of debt service or operating and maintaining the facilities of the Agency or funding reserves therefore, or an unforeseen decrease in revenues. If an increase in the tipping fee is required, the Agency shall notify the Town in writing of such increase at least 30 days before it takes effect. The Agency shall exercise its best efforts to minimize increases in the tipping fee charged to the Town, except that it shall always establish a tipping fee which generates sufficient revenues at all times to pay as the same shall become due, the principal and interest on any bonds issued by the Agency together with the maintenance of proper reserves therefore and the expenses of operating and maintaining the properties of the Agency, together with proper reserves for debt service, depreciation , maintenance and contingencies. The fees and charges shall be collected from all users of the System. Notwithstanding the above, and in order to encourage recycling, the Agency agrees that it will establish no fee or charge for residential recycling of Regulated Recyclable Materials for three years from the effective date of this Agreement. The Agency agrees to take all reasonable steps to provide residential recycling at no charge or fee during the balance of this Agreement, as well. A fee or charge may be established for commercial and institutional recycling of Regulated

Recyclable Materials, said fee shall at no time exceed the actual fee or charge levied against the Agency by the destination market together with the actual costs incurred by the Agency for the collection, sorting and transportation of said materials. For the purposes of this Agreement, the terms "residential", "commercial" and "institutional" shall have the same meaning as set forth in Local Law No. 8 of 1991, **the Mandatory Recycling Law**

Section 5. **The T,C,V's Obligation to Deliver Solid Waste and Regulated Recyclable Materials**

The (T,C,V) shall take Appropriate Action to deliver or cause to be delivered all Solid Waste and Regulated Recyclable Materials generated in or originating in the (T,C,V) to a Solid Waste management facility designated by the Agency. Any such Solid Waste management facility shall be located in the County. For the purposes of this section, the term "Appropriate Action" shall mean and include the following:

a) the establishment of the municipal drop-off center as provided in Section 7 of the Agreement;

b) the exercise by the (T,C,V) of its best efforts to encourage its citizens who self-haul Solid Waste and Regulated Recyclable Materials to utilize the municipal drop-off center;

c) delivery of all Solid Waste and Regulated Recyclable Material generated by the (T,C,V's) operations to the Landfill, ^ municipal drop-off center, or satellite aggregation center;

d) refraining from interfering with the Agency's

receipt of Solid Waste deposited in the Solid Waste roll-off or other proper receptacle, or Regulated Recyclable Materials at the municipal drop-off center, but nothing herein shall restrict the (T,C,V's) authority to deal with non-regulated recyclable materials;

e) exercising best efforts to encourage private haulers of Solid Waste and Regulated Recyclable Materials in the (T,C,V) to dispose of Solid Waste or Regulated Recyclable Materials at facilities designated by the Agency in accordance with the Solid Waste Management Plan;

f) cooperating with and assisting the Agency and the County Health Department in their efforts to enforce laws, rules and regulations governing the disposal of Solid Waste and delivery of Regulated Recyclable Materials in the (T,C,V);

g) taking such other steps as the parties may mutually agree upon, including, after the exercise of its legislative and police powers and pursuant to and in accordance with the State Constitution, Town Law and other statutory authority, the adoption of local laws, ordinances, rules or regulations providing, among other things, for the collection and disposal of Solid Waste and the collection and processing of Regulated Recyclable Materials at facilities designated by the Agency pursuant to the Solid Waste Management Plan.

The (T,C,V) may, if lawful, delegate to the Agency the responsibility of implementing and enforcing the Appropriate Action described in "g" above. The Agency shall accept such delegation.

Section 6. **The (T,C,V)'s Operating Obligation**

The (T,C,V) shall designate a location within the (T,C,V) or jointly designate with other municipalities in the County, an area to be used as a municipal drop-off center for Solid Waste and Regulated Recyclable Materials. The purpose of the municipal drop-off center is to provide the option of self-hauling of Solid Waste and Regulated Recyclable Materials by residents of the (T,C,V). The Agency shall provide the (T,C,V) with assistance in designing the municipal drop-off center. The (T,C,V) agrees that the municipal drop-off center shall be designed and constructed to allow for easy access by the Agency's equipment and vehicles and the residential users. The Agency shall provide roll-off boxes and related equipment for use at the municipal drop-off center as the Agency and Town deem necessary. Equipment provided by the Agency shall remain the property of the Agency. The Agency shall pay for the roll-offs, compactor roll-offs and related equipment to be used at the municipal drop-off center. The Agency shall pay the costs to permit, design, renovate, or construct the municipal drop-off center, up to a maximum of $40,000.00, the funds for which shall be taken from the Agency's first issuance of bonds. The (T,C,V) shall operate and maintain, at its expense, the municipal drop-off center during the term of this agreement. The (T,C,V) shall retain the right to set charges and fees for use of the municipal drop-off center as it deems appropriate, except that so long as the Agency is providing to residential users the service of receiving,

processing and marketing Regulated Recyclable Materials at no charge or fee, the (T,C,V) shall not establish a charge or fee for the receipt of Regulated Recyclable Materials from residential users of the (T,C,V) at the municipal drop-off center.

The Agency shall pull roll-off boxes from the municipal drop-off center using its own agents or staff and equipment, or through contract, and shall transport the Solid Waste to Agency facilities for processing or disposal and Regulated Recyclable Materials to Agency's facilities for processing and marketing. The (T,C,V) shall pay, subject to limitations set forth in Section 4 hereof the charge or fee established by the Agency for such service.

The Agency and the (T,C,V) agree that the municipal drop-off centers shall be operated and maintained in accordance with the performance standards annexed hereto as Exhibit "1". The acceptance standards and performance standards set forth in Exhibit "1" shall remain in effect for a period of not less than two (2) years from the date of this Agreement and shall be amended only on the anniversary date of this Agreement thereafter, unless recycling markets require changes and the Agency is unable to secure other markets.

The (T,C,V) shall notify the Agency in writing immediately after receiving any notice or advice from any governmental entity or other party with respect to any violation of federal, state or local laws, rules or regulations affecting the municipal drop-off center.

Section 7. **Transportation of Other Recyclables**

In the event that the (T,C,V) accepts and collects non-hazardous recyclable material at the municipal recycling center in addition to the Regulated Recyclables, the Agency and the (T,C,V) hereby agree that the materials shall be stored in roll-off containers provided by the (T,C,V) and that the Agency may agree to provide transportation of these containers to destination markets designated by the (T,C,V) if (i) the markets are in Ulster County or within 45 miles of the municipal drop-off center; (ii) the (T,C,V) agrees to pay all costs for the service; (iii) the equipment provided by the (T,C,V) is compatible with Agency equipment; and (iv) the provision of service by the Agency will not adversely impact its ability to provide service under the other provisions of this Agreement.

Section 8. **Municipal Yard Waste Composting and Clean Wood Waste Handling Program**

The Agency has established a municipal yard waste composting and clean wood waste handling program ("MCP"). The terms and conditions of the program are annexed hereto as Exhibit "2". The (T,C,V) may agree to participate in and comply with the MCP in accordance with those terms and conditions. The (T,C,V) may satisfy this obligation by jointly agreeing with another municipality to participate in the program.

Section 9. **Maximization of Reduction, Reuse and Recycling Initiatives**

It is the intent of the Agency and the (T,C,V) in entering into this Agreement to maximize the reduction, reuse, and recycling of materials. The Agency agrees to provide, pursuant to the Plan, a vigorous education program to encourage the inhabitants of the (T,C,V) to reduce, reuse, and recycle materials to the maximum extent possible. The (T,C,V) agrees to participate in such an education program and to encourage its inhabitants to participate in such efforts. Within the first year of the term of this Agreement, and upon request of the (T,C,V), the Agency agrees to establish at the municipal drop-off center a used tire and white goods program. The Agency shall use its best efforts to expand the definition of Regulated Recyclable Materials pursuant to Local Law No. 8.

Section 10. **Landfill Consolidation Plan**

The Agency has prepared, and NYSDEC has approved **and issued**, a Landfill Consolidation Plan dated _____, 1992. The Landfill Consolidation Plan provides ^ for the continued operation of certain ^ landfills for a period of time by the Agency. The Agency shall operate those landfills in accordance with 6 NYCRR Part 360 and shall designate one of those facilities for use by the (T,C,V) for disposal of Solid Waste. The (T,C,V) agrees to close its existing municipal landfill in accordance with the Landfill Consolidation Plan and the consent order issued to the (T,C,V) by NYSDEC for that purpose. The Agency agrees to cooperate with the (T,C,V) in its closure efforts, including directing

certain Solid Waste to the (T,C,V) if mutually acceptable to the Agency and the (T,C,V) to enhance its closure procedures.

Section 11. **Landfill Closure Assistance Program**

The Agency shall establish, after review and comment by the (T<C,V) and approval by the County Legislature, a Landfill Closure Assistance Program. Pursuant to the Program, the Agency shall provide to the (T,C,V), in accordance with the terms and conditions of the program to be established, up to $500,000 cash reimbursement for qualified expenditures of the (T,C,V) for closure of its existing landfill at _____, or the cash equivalent of services, goods or materials provided by the Agency or its agents for such purposes. In no event shall the reimbursement or value of services provided exceed the cost to close the landfill. If the cost to close the landfill exceed the amount of $500,000 then any funds available in the Program, after initial allocation to all participants, shall be allocated among the municipalities in accordance with a formula to be established as part of the Program. The funds for the Program shall be taken from the Agency's first issuance of bonds.

Assistance provided hereunder may take the form of materials, equipment, consulting, construction or other services to be procured by the Agency on behalf of the (T,C,V).

Section 12. **Insurance**

The Agency shall obtain and maintain at its own

expense throughout the term of this Agreement and during the monitoring period insurance, to the extent commercially available, ^ to cover the properties and the liabilities of the Agency. The (T,C,V) shall be named as an additional Insured. The (T,C,V) shall maintain insurance coverage in the same amount set forth in (a) ^ below covering its operation of the ^ municipal drop-off center. The Agency shall be named as an additional Insured on the (T,C,V's) policy.

^

The insurance policies shall be obtained from a good and solvent insurance company or companies licensed to do business in the State of New York. The insurance policies shall include the following:

(a) a comprehensive general liability insurance with broad form extension for personal injury, death and/or property damage in limits of not less than Two Million Dollars combined single limits; and

^

The Agency shall furnish the (T,C,V) with certificates for each of the aforesaid insurance policies provided for above and shall provide the (T,C,V) with the renewals therefor, when due, during the term of this lease.

Section 13. Reports

The Agency shall report on a regular basis to the (T,C,V) with respect to such matters relating to the operation and

maintenance of the System and the administration of this Agreement, including: (i) the number of gross tons of Solid Waste or Regulated Recyclable Materials delivered to the System; (ii) the quantity of Solid Waste disposed of and Regulated Recyclable Materials processed and sold; (iii) the types and quantity of wastes which were refused acceptance for disposal or processing; and (iv) the amount and price of Regulated Recyclable Materials sold and other revenues.

Section 14. Indemnification with Respect to System Operation The Agency agrees that it will protect, indemnify, and hold harmless the (T,C,V) and its officers, employees and agents (collectively, the "Indemnified Parties") from and against all liabilities, actions, damages, claims, demands, judgments, losses, costs, expenses, suits or actions and attorneys' fees, and will defend the Indemnified Parties in any suit, including appeals, for personal injury to, or death of, any person or persons, or loss or damage to property arising out of the operation of the System or the performance (or non-performance) of the Agency's obligations under this Agreement. The Agency shall not, however, be required to reimburse or indemnify any Indemnified Party for loss or claim due to the negligence of any Indemnified Party, and the Indemnified Party whose negligence is adjudged to have been the primary cause of such loss or claim will reimburse the Agency for the costs of defending any suit as required above. An Indemnified Party shall promptly notify the Agency of the

assertion of any claim against it for which it is so entitled to be indemnified, shall give the Agency the opportunity to defend such claim, and shall not settle such claim without the approval of the Agency. These indemnification provisions are for the protection of the Indemnified Parties only and shall not establish, of themselves, any liability to third parties.

Section 15. Notice of Litigation

The (T,C,V) shall deliver written notice to the Agency of any litigation or similar proceeding to which the (T,C,V) shall be a party and which shall question the validity or enforceability of this Agreement. The Agency shall undertake to defend any such litigation or proceeding, or pay the costs thereof.

Section 16. Default

(a) Default by the Agency

The occurrence of any of the following shall constitute a default by the Agency:

(1) The failure on the part of the Agency to maintain insurance as agreed; and

(2) The failure on the part of the Agency to observe or perform any of the other terms of this Agreement on the part of the Agency to be observed and performed; and

(3) The cancellation of the Agency's power to act by judicial decree, legislative enactment or otherwise; and

(4) The filing of a petition in bankruptcy or the

petition for any other relief from creditors under any Federal or State law, as well as an assignment for the benefit of creditors, or the appointment of a Receiver.

In the event of any default as set forth in this paragraph above, the (T,C,V) must give written notice to the Agency calling attention to the existence of such failure. If the failure is not cured within twenty (20) days after notice thereof, then the (T,C,V) shall remove its effects from the municipal drop-off center and the (T,C,V) shall have all other remedies provided by law or equity or contract.

In the case of any default, the (T,C,V) may recover against the Agency any legal money damages or costs and expenses permitted in an action at law or equity as may be justified under all the circumstances.

(b) Default by the (T,C,V)

The failure on the part of the (T,C,V) to observe or perform any of the other terms of this Agreement on the part of the (T,C,V) of be observed and performed shall constitute a default hereunder.

In the event of any default as set forth in the paragraph above, the Agency must give written notice to the (T,C,V) calling attention to the existence of such failure. If the failure is not cured within twenty (20) days after notice thereof, then the Agency may institute legal or equitable proceedings as it deems proper. The Agency shall have all remedies provided by law or equity or contract, including money damages or costs and expenses permitted

in an action at law or equity as may be justified under all the circumstances.

Section 17. Term of Agreement

This Agreement shall be in full force and effect and be legally binding upon the Agency and the (T,C,V) from the date of the execution and delivery hereof. This Agreement shall remain in full force and effect through July 1, 2002, and may be renewed by mutual agreement of the parties for an additional 10 year period. Notwithstanding anything in this section to the contrary, this Agreement shall remain in full force and effect as long as any bonds issued by the Agency in accordance with the Act and the Service Agreement with the County to finance the System remain outstanding or until adequate provision is made for the payment or satisfaction thereof, whichever is later.

Section 18. Amendment of Agreement.

This Agreement may be amended, waived, modified, and supplemented by agreement of the parties. Any amendment to this Agreement so consented to as provided above shall be by written agreement, duly authorized and executed by the Agency and the (T,C,V).

Section 19. Notices

Any notice or communication required or permitted hereunder shall be in writing and sufficiently given if delivered

in person or sent by certified or registered mail, postage prepaid, as follows:

If to the (T,V,C): Supervisor/Mayor
(address)

If to the Agency: Ulster County Resource Recovery Agency
Attention: Executive Director
52 Main Street, UPO Box 4298
Kingston, New York 12401

Changes in the respective addresses to which such notices may be directed may be made from time to time by any party by notice to the other party.

Section 20. Severability

If any provision of this Agreement shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such provision shall not effect any of the remaining provisions of this Agreement and this Agreement shall be construed and enforced as if such invalid and unenforceable provision had not been contained herein.

Section 21. Execution of Documents

This Agreement may be executed in any number of counterparts, any of which shall be regarded for all purposes as an original and all of which shall constitute but one and the same instrument. Each party agrees that it will execute any and all deeds, documents or other instruments, and take such other action as is necessary to give effect to the terms of this Agreement.

Section 22. Entirety

This Agreement merges and supersedes all prior negotiations, representations and agreements between the parties hereto relating to the subject matter hereof and constitutes the entire agreement between the parties hereto in respect thereof, all prior negotiations, representations and agreements, whether oral or written, having been merged herein.

Section 23. Waiver

Unless otherwise specifically provided by the terms of this Agreement, no delay or failure to exercise a right resulting from any breach of this Agreement will impair such right or shall be construed to be a waiver thereof, but such right may be exercised from time to time and as often as may be deemed expedient. Any waiver must be in writing and signed by the party granting such waiver. If any covenant or agreement contained in this Agreement is breached by any party and thereafter waived by any other party, such waiver will be limited to the particular breach so waived and will not be deemed to waive any other breach under this Agreement.

Section 24. Governing Law and Jurisdiction

This Agreement shall be governed by and construed in accordance with the laws of the State.

Section 25. References and Headings

Except as otherwise indicated, all references herein to Sections are to Sections of this Agreement. Section headings herein have been inserted for convenience of reference only and will not limit, expand or otherwise affect the construction of this Agreement.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized officers or representatives as of the day and year first above written.

ULSTER COUNTY RESOURCE RECOVERY AGENCY

BY:_____
TITLE:

(T,C,V) OF

BY:_____
TITLE:

EXHIBIT #1

IMA PERFORMANCE STANDARDS

#2-SCHEDULING PROCEDURES-HAULING NEWS, GLASS, AND METAL CANS

- Municipality will call the Agency (339-1223) when pull is needed.
- Calls made between 9:00 and 12:00 will be scheduled on that day. Calls made after 12:00 will be scheduled the following day.
- **Rolloff should be almost full when call is made.**
- The Agency will record the following information:
  date and time of call
  town and contact person
  material to be pulled
  roll-off box number
  any special considerations you may have.
- The Agency will schedule pickups and make all necessary arrangements with its contracted haulers.
- Pickup will normally occur within 48 hours of call. The Municipality will be notified if this can not be met.
- Roll-offs **should be full** when picked up.
- An empty replacement roll-off will be left at that time or in some cases, the following day.
- The Agency's haulers will keep a trip log.
- The Agency recommends that each Municipality maintain its own records as well.
- The Agency will provide each municipality with quarterly volume reports for materials collected by the Agency under the IMA.
- The Municipality will provide the Agency with quarterly volume reports for all other recycled materials.
- The Municipality should notify the Agency directly if there are any problems. The Agency's haulers should not be contacted for any reason.

NOTE: We are only hauling glass, news and metal cans at this time. The other IMA materials (plastic, cardboard and office paper) will be added to our hauling system within the next few months. **In the meantime, continue to recycle these materials as you have been in the past.**

If you have any questions during this transitional phase, please feel free to call Orvil Norman,composting coordinator, or Amy Kletter,research recycling assistant, at the Agency.

#3-MINIMUM MARKET SPECIFICATIONS FOR MATERIALS TO ENTER SAC SYSTEM

In order to market recyclables, it is necessary to maintain a level of quality acceptable to the end market. In the SAC system in which you are participating; the County is responsible for collection of recyclables from the MRDS, for any necessary processing, and delivery to market. The municipality controls the quality of material brought into its system through its own program. It is then responsible for the quality of the material **before it enters the SAC system.** This may or may not require minimal cleaning or sorting at the MRDS before the materials are picked up by an Agency hauler. Series #3 delineates the **minimum market specifications** for each material. In addition, #3 may include other material conditions which the market does not demand, but which will improve the quality of the material. It is recommended that you add these **material preferences** to your program, but it is not necessary for meeting your obligation in the IMA.

#3B-GLASS

MARKET SPECIFICATIONS

- Color separated **bottles and containers only**
- Three colors only-clear, green and brown
- **Rinsed and empty**

MATERIAL PREFERENCES

- Caps/lids removed
- Labels **do not** need to be removed

ACCEPTABLE MATERIALS	UNACCEPTABLE MATERIALS
soda bottles	ceramics of any kind- cups, plates, ceramic caps
beer bottles	clay flower pots
juice jars	crystal
wine and liquor bottles	light bulbs
any glass food or beverage containers	mirrors
metal caps or lids	windowpane glass of any kind
	glass ovenware
	drinking glasses
	any non-glass material such as dirt,rocks,stones,asphalt, garbage,wood debris,plastic,

contamination threshold-

Glass Recycling Made Easy

Acceptable

Glass food and beverage containers can be easily recycled by glass container plants. Generally speaking, metal caps and lids should be removed but labels can remain.

Soda Bottles

Beer Bottles

Juice Containers

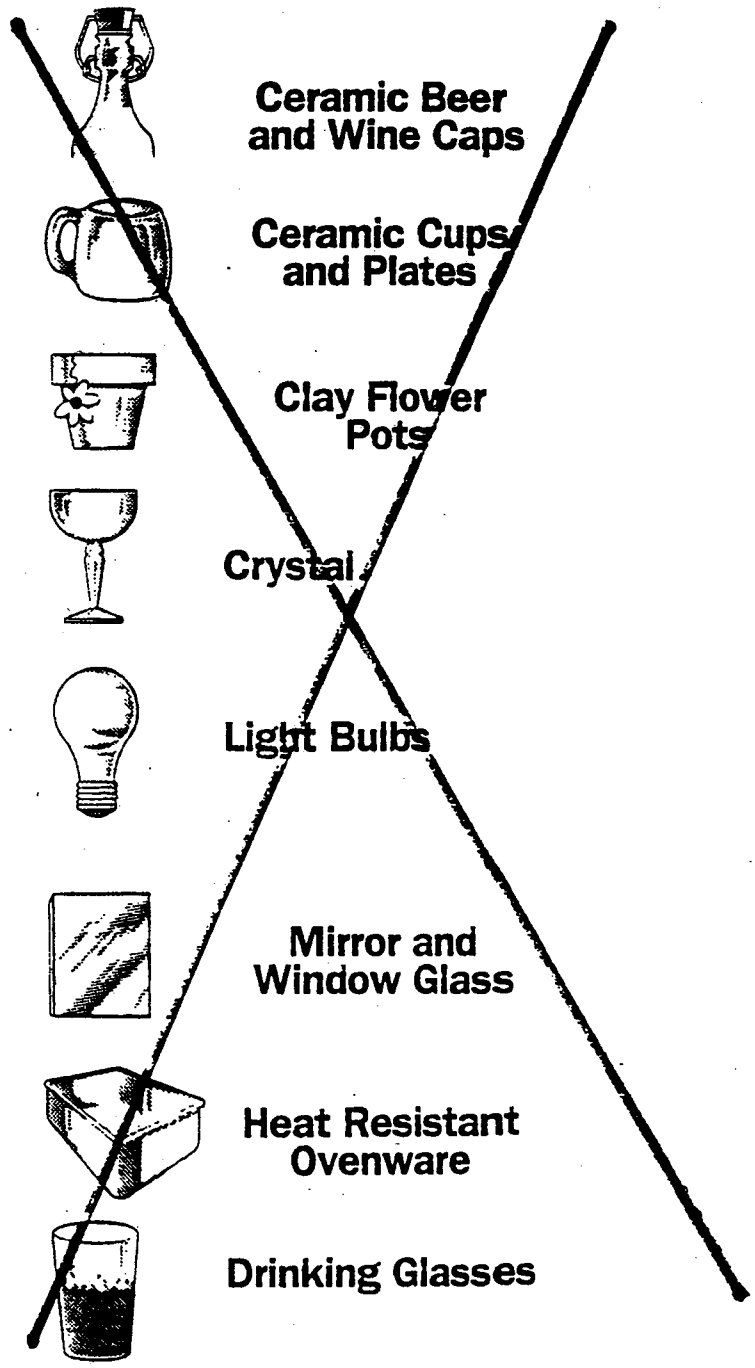
Ketchup Bottles

Wine and Liquor Bottles

Food Containers

Not Acceptable

The following materials are not recycled by glass container plants and should not be mixed in with container glass.



Ceramic Beer and Wine Caps

Ceramic Cups and Plates

Clay Flower Pots

Crystal

Light Bulbs

Mirror and Window Glass

Heat Resistant Ovenware

Drinking Glasses

#3C-METAL CANS

MARKET SPECIFICATIONS

- Empty, rinsed metal cans of all types
- All types of metal cans will be mixed in one roll-off

MATERIAL PREFERENCES

- Prefer flattened and labels off

ACCEPTABLE MATERIALS

aluminum cans
tin-plated cans
zinc-plated cans
bi-metal cans
can tops, bottoms, ends (if metal)
metal jar or bottle lids
aerosol and paint cans - only if empty

contamination threshold-

UNACCEPTABLE MATERIALS

cans with significant residue
other metalware- coat hangers, pots and pans, etc.
aluminum foil or pie tins
paper food containers
plastic lids or caps
non-metallic materials such as dirt, wood, garbage, etc.

#4-QUALITY CONTROL

In order to market recyclables, it is necessary to maintain a **level of quality acceptable to the end market.** The Agency is responsible for the hauling, processing and marketing of the IMA materials. The Municipality is responsible for collecting these materials and then providing them in a condition acceptable to the Agency (see Performance Standard #3-Minimum Market Specifications). The Performance Standard that follows outlines the procedures that will be taken to insure quality control.

- Full roll- off containers **should be checked by the Municipality prior to scheduling pick-up.**
- Loads will be inspected for contamination at the Agency designated aggregation center by Agency personnel.
- The Municipality will be contacted if contamination is considered to be above threshold levels as defined in Performance Standard #3.
- The Municipal representative and the Agency representative will reinspect the load and mutually decide on the course of action to be taken.
  Either:
  1. Agency could return load to Municipality at Municipality's expense.
  2. Municipality could clean load at Municipality's expense.
  3. Agency could clean load at Municipality's expense.
  4. Load could be disposed of at Municipality's expense if excessive contamination renders it unsalvagable.
- For the first contaminated load of any given material, the Agency will assume all responsibility.
- For any subsequent contamination of any given material, the Municipality will assume all responsibility.

EXHIBIT "2"

TERMS AND CONDITIONS OF THE

MUNICIPAL YARD WASTE COMPOSTING AND

CLEAN WOOD WASTE HANDLING AGREEMENT

BETWEEN THE ULSTER COUNTY RESOURCE RECOVERY AGENCY

AND (the "MUNICIPALITY")

WHEREAS, the Agency has established a county-wide municipal yard waste and clean wood waste management program (the "Program") to manage municipally collected yard and clean wood waste and process it for beneficial use as compost or mulch, and

WHEREAS, the Agency has received a grant from the State of New York for such purpose and has purchased equipment, including a tub grinder and tractor, for the Program (the "Equipment"), and

WHEREAS, the County of Ulster has entered into an Operating Agreement with the Agency to store, transport, operate and maintain the Equipment, and

WHEREAS, it is the desire of the Agency and Municipality to set forth the conditions of the Program, as more fully described in Exhibit "A" (the "Municipal Yard Waste Composting And Clean Wood Waste Performance Standards"):

1. AGENCY RESPONSIBILITIES The Agency's responsibilities shall be as follows:

A) Program and Equipment - implement the Program as more fully described in Appendix "A" and provide Program procedures and Equipment. The Agency shall cause the Equipment to be brought to a location within the Municipality that is acceptable to both parties. The Equipment shall be and remain at all times under the supervision and control of the Agency or

Equipment shall be used to grind the yard waste and clean wood waste into processed material as more fully described in Exhibit "1".

B) Personnel - Provide personnel to implement and carry out the Program, and operate the Agency's Equipment. The Agency shall provide operators for the Equipment through its present contractor, the Ulster County Department of Public Works, or any other agent designated by the Agency.

C) Contact Person - Designate a person to serve as a liaison between the Agency and the Municipality and to whom the Municipality may contact to schedule the grinding operations.

D) 1. Municipality Processing Site - Provide technical assistance to the Municipality in identifying a location for the collection, storage and handling of the yard and clean wood waste, processed material and compost.

2. Municipality Composting Site - Assist the Municipality in obtaining a Department of Environmental Conservation (DEC) permit for a composting facility, if the location requires a permit, including assistance with the State Environmental Quality Review Act and Part 360 of the New York Code of Rules and Regulations (NYCRR).

E) Education and Training - Provide training and education for personnel and the general public to insure the Program is carried out properly and the yard and clean wood waste is properly handled, processed and composted into a beneficial material.

F) Use of Material (i) - Process yard and clean wood waste in such a fashion that the Municipality may use the processed material for composting, mulch, or any other beneficial use in accordance with Exhibit "1".

(ii) - From time to time the Agency may utilize a mutually agreed upon percentage of the compost or mulch at no charge to the Agency. The Agency may test the processed or composted material that it utilizes for compatibility with New York State Department of Environmental Conservation guidelines.

G) Service - Properly, timely, and safely grind the yard and wood waste and service the Municipality in accordance with Exhibit "1".

H) Reporting - Design and provide reporting forms for the Municipality to use and submit to the Agency in a timely fashion. The Agency shall submit grinding reports to the Municipality as more fully described in Exhibit 1 in a timely

fashion.

2. MUNICIPALITY'S RESPONSIBILITIES The Municipality's responsibilities shall be as follows:

A) Program and Equipment - Participate in all aspects of the Program as set forth in Exhibit "1", provide any Equipment necessary to augment the operation of the Program, compost the processed compostable material, and utilize the processed and composted material in accordance with Exhibit "1".

B) Personnel - Provide necessary personnel to augment the operation of Program and compost the processed compostable material.

C) Contact Person - Appoint or otherwise continue to provide a local contact person to serve as a liaison between the Agency and the Municipality with regard to the Program and to contact the Agency when it has a sufficient amount of yard or clean wood waste for grinding.

D) 1. Municipality Processing Site - Provide a location for the collection, storage and handling of yard and clean wood waste, processed material and compost.

2. Municipality Composting Site - Establish and maintain a facility for composting yard waste. If the Municipality requires a DEC permit for a composting facility, it must seek the necessary permit, permit modification, or exemption for its facility according to 6 NYCRR Part 360. The Municipality may request Agency assistance in establishing and permitting the facility.

E) Education and Training - Participate in a community-wide public education and information Program, keep up-to-date on the technical, regulatory and legal developments in composting and use of the processed material, and assist the Agency in carrying out the educational Program.

F) Use of Material (i) - Utilize for the Municipality's own operations the processed yard and wood waste to create compost or mulch, or any other beneficial material in accordance with Exhibit "1". The Municipality may also make the processed or composted material available for public use in accordance with Exhibit "1" and Part 360 of the NYCRR.

(ii) - Allow the Agency to utilize a mutually agreed upon percentage of the processed and composted material at no cost to the Agency, and allow the Agency access to the material to test it for compatibility with New York State Department of Environmental Conservation guidelines.

G) Service - Refrain from burning or depositing the yard waste or clean wood waste in a landfill, except as specified in Exhibit "1".

H) Reporting - submit volume reports to the Agency on a timely basis as more fully described in Exhibit 1.

3. TERM - the term of the Agreement shall commence on January 1, 1992 and shall end one year thereafter. At the end of the term, the parties may mutually agree in writing to extend the Agreement.

4. COST OF SERVICE - All cost in connection with the operation, storage, maintenance, repair and replacement of the Equipment and the development of the training and education Program shall be the responsibility of the Agency, except where the Equipment is damaged due to contaminants in the yard or clean wood waste, the municipality then shall pay for the parts and labor to repair the Equipment. All cost concerning the collection and preparation of yard and clean wood waste for grinding, composting of processed material, and use and distribution of the processed or composted material shall be the responsibility of the Municipality. Should the Agency find it necessary to store Equipment at the Municipality's processing or composting site temporarily, the Municipality agrees to permit such storage at no charge to the Agency or County and at no liability to the Municipality.

5. DEFINITIONS -

A) **"Clean Wood Waste"** shall mean dry untreated and unpainted wood up to 6 inches in diameter and up to 6 feet long (i.e. brush, clean wood/lumber, branches and small tree limbs), and clean pallets.

B) **"Composting"** shall mean the process of aerobic, thermophilic decomposition by microbial degradation of solid organic constituents of yard and clean wood waste to produce a stable, humus-like material called compost.

C) **"Contaminant"** shall mean a substance(s) or condition(s) that when added to the yard waste or clean wood waste, compost or mulch render the material unfit for that purpose.

D) **"Dirty Wood Waste"** shall mean Construction and Demolition Wood (C & D Wood) which includes treated wood (i.e painted, stained, or pressure treated wood) and wood with glues (i.e. plywood, particle board, chipboard) and unclean pallets.

E) **"Yard Waste"** shall mean leaves, grass clipping, lawn and garden wastes, weeds, twigs and shrubbery clipping, tree and

shrub trimmings, and Christmas trees.

6. LIABILITY -

A) The Municipality agrees to defend, indemnify and hold the Agency, the County and the State of New York harmless from any and all claims that may arise out of the Municipality's negligent acts.

B) The Agency shall cause the County to provide an indemnification agreement from the County to the Municipality indemnifying the Municipality from the County's acts or failures to act under the operating agreement.

C) This Agreement has been executed by the Agency as part of a governmental function. The Agency makes no express or implied guarantees or warranties as to the material or the particular uses of the material. The Municipality, at its own risk, will use and permit the use of the yard and clean wood waste processed by the Agency's Equipment.

D) The Municipality agrees to promptly reimburse the Agency for any cost of repairs, pursuant to paragraph 4 of this Agreement.

7. MISCELLANEOUS - the following miscellaneous provisions shall apply to the Agreement:

A) Construction of the Agreement - the parties acknowledge that the Agreement was prepared under New York law and shall therefore be interpreted under the laws of New York.

B) Amendment or Modifications - the Agreement may not be amended, altered, or modified in any manner except in writing signed by the parties hereto.

C) Headings - this section and any other headings contained in the Agreement are for reference purposes only and shall not affect the meaning and interpretation of this Agreement.

D) Invalid Clause - the invalidity of any clause contained herein shall not render any other provision invalid and the balance of the Agreement shall be binding upon all parties hereto.

E) Entire Agreement - the Agreement shall consist of the entire Agreement of the parties and it is acknowledged that there are no side or oral Agreements relating to the undertaking set forth herein.

IN WITNESS WHEREOF, the parties hereto have placed their signatures and appropriate seals on the day and year mentioned on the face of the Agreement.

ULSTER COUNTY RESOURCE RECOVERY AGENCY — SEALS

BY: _____
Executive Director

DATE: _____

TOWN OF

BY: _____
Supervisor

DATE: _____

EXHIBIT "1"

MUNICIPAL YARD WASTE COMPOSTING AND CLEAN WOOD WASTE PERFORMANCE STANDARDS

A. SCHEDULING SERVICE OF THE EQUIPMENT

1. The Agency will schedule the Municipalities for receiving the Equipment services.

2. The Municipality will contact the Agency to schedule use of the Equipment when it has approximately 500 cubic yards of material for grinding.

3. The Municipality will give the Agency at least 2 weeks advance notice to arrange for the transportation and operation of the Equipment at the Municipality's Processing Site.

4. If the Municipality is not prepared for processing, as required in Subsection C of this Exhibit, when the Agency arrives with the Equipment, the Agency may move to the next scheduled Municipality, unless the Agency's contact person makes other arrangements with the unprepared Municipality.

B. USE OF EQUIPMENT

1. The Agency will operate the tub grinder all year, weather permitting.

2. The Agency will place the tub grinder at a level site so that the wind (if any) will be blowing from the tractor to the rear conveyor belt, and the stabilizing legs will be on a solid footing.

3. The Agency will set up the tub grinder at the agreed upon location that must be at least 300 feet away from areas where people will be congregating.

4. The Agency shall provide at least 2 persons to perform the grinding services. One person to operate the tub grinder, and the other person to watch for problems and to help remove contaminants from the material.

C. PREPARATIONS FOR GRINDING

1. Before the Equipment arrives at the Municipality Processing Site, the Municipality must have the material separated into at least 3 piles:

   Pile #1: leaves, grass clippings, weeds, twigs, shrubbery clippings, lawn and garden wastes.

   This material is known as yard waste and may be composted without being ground by the tub grinder.

   Pile #2: green tree and shrub trimmings, Christmas trees, or any other yard waste requiring grinding.

   This material is also known as yard waste. It must be ground in the tub grinder and then can be added to pile #1 for composting.

   Pile #3: Clean wood waste.

   This material must be ground in the tub grinder and then can be used as chips and mulch.

   NOTE: Dirty Wood waste cannot be ground in the tub grinder. It must be separated from the yard and clean wood waste piles (1,2 and 3 above) and disposed of in accordance with existing local and state regulations.

2. The Municipality is responsible for getting the material to be processed to within reach of the Equipment.

3. The Municipality is responsible for ensuring that the yard and clean wood wastes are reasonably free of contamination. Prior to Agency grinding, unreasonable amounts of contamination must be removed by the Municipality.

   a) Yard Waste is leaves, grass clippings, lawn and garden wastes, weeds, twigs, shrubbery clippings, green tree and shrub trimmings, and Christmas trees.

   Yard waste should not contain clean wood waste.

   b) Clean Wood Waste is dry untreated and unpainted wood up to 6 inches in diameter and up to 6 feet long (i.e., brush, clean wood/lumber, branches and

small tree limbs), and clean pallets.

c) Contaminants to yard waste and clean wood waste include, but are not limited to:

- materials greater than 6 inches in diameter or 6 feet in length
- railroad ties, electric poles, pressure treated lumber, etc.
- dirty wood waste as defined in the Agreement
- construction and demolition debris (C&D)(i.e., bricks, rocks, concrete, plaster, painted wood, etc.)
- scrap metal including steel, iron, aluminum, appliances, furniture, etc.
- materials that contain any non-wood substances (i.e. plastic bags, glass containers, storm doors and windows, etc.)
- hazardous/toxic materials, and chemicals
- furniture, bedding and clothing (especially nylon, rayon, and synthetic clothing)
- animal waste, food waste (i.e. meats, fats, dairy products) animal parts, and manure
- municipal solid waste

NOTE: Small nails, staples, brads, screws, etc. are acceptable in clean wood waste. Spikes are not acceptable.

D. REQUIREMENTS DURING GRINDING

During the tub grinding operations, the Municipality's responsibilities are the following:

1. To remove contaminants from the material before the material enters the grinder.

2. To bring the raw material to and remove processed material from the tub grinder during operations.

E. REQUIREMENTS AFTER GRINDING

After the materials have been ground, the Municipality must establish and properly manage:

1. A compost pile integrating the finer materials such as leaves, grass clippings, finely ground brush and Christmas trees.

2. A mulch pile integrating clean wood waste and coarser ground yard waste.

Should the Municipality need a composting permit, the Agency will assist the Municipality in obtaining the permit.

The Municipality shall reimburse the Agency for costs incurred in repairing the following portions of the Equipment, if any of the Equipment is damaged by contamination:

a. screens
b. hammers
c. springs
d. belts
e. chains
f. wear plates
g. or any other parts directly involved in the grinding operation.

F. USES OF COMPOST, CHIPS AND MULCH

1. Acceptable uses for yard waste compost by the Municipality (or residential, commercial or institutional sector as permitted by the Municipality) are:

a. Soil conditioner
b. Gardening
c. Landscaping
d. Lawn care
e. Revegetation
f. Erosion prevention
g. Top dressing for existing soils (i.e. for lawns)
h. As final landfill cover (6" topsoil) for landfill closure

2. Acceptable uses for chips or mulch by the Municipality (or the residential, commercial or institutional sectors as permitted by the Municipality) are:

a. Bulking agent for yard waste compost (adding the mulch to the

yard waste compost as a bulking agent slows the composting process from 6 months to 12-18 months.)

b. Landscaping (i.e. ground cover around shrubs and trees)
c. Weed control
d. Dust control
e. Water control - on or off footprint
f. As daily landfill cover in a ratio 25:75, chips to soil, or 25% chips or mulch to 75% soil (by volume)

3. Using the Processed Material as landfill cover is considered the least beneficial use of the material and is permitted only if the other higher uses are not available.

4. The Municipality is responsible for informing all end-users of the acceptable uses and the limitations of the processed material.

5. The Agency does not recommend the use of the material in and around food crops.

G. BURNING AND LANDFILLING THE MATERIAL

1. The Municipality may landfill if the material becomes a fire hazard.

2. The Municipality may burn the material if the material becomes a fire hazard and the Municipality has a permit from the Department of Environmental Conservation to burn the material.

H. REPORTING REQUIREMENTS

1. The Agency shall submit a monthly report to the Municipality setting forth the grinding operations for the previous month for all municipalities in the County with monthly and year to date totals.

2. The Municipality shall submit a monthly report to the Agency setting forth separate totals for the volumes of yard waste, clean wood waste, compost, and chips and mulch on hand at the end of each month on a form supplied to the Municipality by the Agency.

DRAFT
7/08/92

Attachment C-3

SOLID WASTE MANAGEMENT AGREEMENT

Between

THE ULSTER COUNTY RESOURCE RECOVERY AGENCY

and

THE TOWN OF _____

Dated as of _____, 1992.

SOLID WASTE MANAGEMENT AGREEMENT

SOLID WASTE MANAGEMENT AGREEMENT dated as of _____, 1992 between the ULSTER COUNTY RESOURCE RECOVERY AGENCY, a public benefit corporation duly organized and existing under the laws of the State of New York and having its principal offices at 52 Main Street, UPO Box 4298, Kingston, New York 12401 (the "Agency") and the Town of Wawarsing, a municipal corporation of the State of New York having its principal offices at 108 Canal Street, P. O. Box 671, Ellenville, New York 12428 (the "Town"):

W I T N E S S E T H:

WHEREAS, the disposal of solid waste generated in or originating in the County of Ulster (the "County") is a serious problem that poses a threat to public health and safety and the environmental unless properly managed; and

WHEREAS, at the request of the Town and other communities within the County, the Ulster County Legislature (the "County Legislature") petitioned the New York State Legislature to create by special act the Agency and empowered the Agency to, among other things, plan, develop, finance, construct, upgrade, renovate, and operate solid waste management facilities; and

WHEREAS, the Agency has been established as the "local planning unit" as that term is defined in Article 27 of the Environmental Conservation Law and "lead agency" as that term is defined in Article 8 of the Environmental Conservation Law and 6

NYCRR Part 360 (collectively "SEQRA") to prepare a comprehensive solid waste management plan (the "Plan"), and conduct a review thereof pursuant to SEQRA, which Plan includes the following initiatives: implementation of a County-wide solid waste reduction, reuse and recycling plan; selection of solid waste disposal technologies; and implementation of host community benefit programs for municipalities effected by Agency-owned facilities; and

WHEREAS, a final generic environmental impact statement ("GEIS") and supplemental final GEIS were duly authorized, undertaken, completed and filed; and

WHEREAS, the Agency, the County, and the New York State Department of Environmental Conservation ("NYSDEC") have approved a plan and adopted findings in connection with the final GEIS and supplemental final GEIS; and

WHEREAS, the Plan provides for a comprehensive program to manage solid waste in the County for the next 20 years; and,

WHEREAS, in support of the Agency's implementation of the Plan, the County Legislature has adopted and approved Local Law No. 8 - 1991, the Mandatory Source Separation and Recycling Law and Local Law No. 9 - 1991 Solid Waste Management Law, and has approved a Solid Waste Service Agreement between the County and the Agency which provides for the terms and conditions of the Agency's assumption of responsibility for management of the County's solid waste, and for the payment by the County of "net service fees" in consideration of the Agency's providing solid waste management

services as defined therein, and

WHEREAS, the Town and the Agency desire to establish the terms and conditions pursuant to which the Agency shall undertake responsibility for managing solid waste in the Town and to assume responsibility for certain existing facilities of the Town; and

WHEREAS, it is the purpose of this Agreement to ensure a coordinated transition of responsibility for solid waste management from the Town to the Agency and the provision by the Agency of solid waste management services for the Town during the term of this Agreement,

NOW, THEREFORE, the Agency and the Town in consideration of the premises and the respective representations and agreements hereinafter contained and other good and valuable considerations, receipt of which is hereby acknowledged, agree as follows:

Section 1. Definitions

For the purpose of this Agreement, the following words and terms shall have the respective meanings set forth below, unless the context otherwise requires:

"Act" means Title 13-G of the Public Authorities Law of the State.

"Agency" means Ulster County Resource Recovery Agency, a corporate governmental agency constituting a public benefit corporation of the State duly organized and existing under the laws of the State, and any body, board, authority, agency or other political subdivision of the State which shall hereafter succeed to the powers, duties and functions of the Agency.

"Agreement" means this Solid Waste Management Agreement and any supplements and amendments hereto made in conformity with the terms hereof.

"County" means the county of Ulster, State of New York.

"Effective Date" means the date service is first provided hereunder by the Agency.

"Regulated Recyclable Materials" means newspaper, color-separated glass bottles and jars, metal cans, plastic bottles and jugs, corrugated cardboard and any other materials as may be designated by the Agency in accordance with Local Law No. 8 of 1991.

"Solid Waste" means all materials or substances discarded or rejected within the Town as being spent, useless, worthless, or in excess to the owners at the time of such discard or rejection, including, but not limited to garbage, refuse, industrial and commercial waste, sludges from air or water pollution control facilities or water supply treatment facilities, rubbish, ashes, contained gaseous material, incinerator residue, demolition and construction debris and offal, but not including sewage and other highly diluted water-carried materials or substances and those in gaseous form, source, special nuclear or by-product material within the meaning of the United States Atomic Energy Act of 1954, as amended, waste which appears on the list of hazardous waste promulgated by the Commissioner of Environmental Conservation pursuant to Section 27-0903 of the Environmental Conservation Law of the State of New York, and scrap or other material of value

separated from the waste stream and held for purposes of materials recycling, as such definition may be amended from time to time by the State.

"Solid Waste Flow Control Laws" means the provisions of Local Law No. 8 of 1991 and Local Law No. 9 of 1991 which respectively require the delivery of Regulated Recyclable Materials and the disposal of Solid Waste at designated facilities.

"Solid Waste Management Plan" means the plan for management of Solid Waste in the County approved by the State Department of Environmental Conservation on December 3, 1991, as amended from time to time pursuant to law.

"State" means the State of New York.

"System" means collectively all elements of any sites containing the facilities constructed or obtained by the Agency to carry out the purposes of this Agreement, including Interim Satellite Aggregation Centers for the processing of Regulated Recyclable Materials and interim landfills to be obtained pursuant to law and agreement with the municipalities owning such landfills, including the Town pursuant to this Agreement, and the facilities identified in the Solid Waste Management Plan and alternate disposal sites, except that the term System shall not include any incinerator or waste-to-energy facility.

"Town" means the Town of Wawarsing.

Section 2. **Provision of the System by the Agency**

The Agency will cause the planning, design, acquisition,

construction, renovation, completion and operation of the System in accordance with the Solid Waste Management Plan. The Agency shall cause the costs of planning, designing, acquiring, constructing, renovating, equipping and completing the System to be financed through the issuance of revenue bonds. Any revenue bonds issued by the Agency shall not constitute a debt of the State, County or Town and neither the State, County or Town shall be liable thereon.

All facilities of the System will be planned, designed, acquired, equipped, completed and operated so as to meet all applicable permit conditions and environmental requirements. The Town shall have no obligation to pay for any of the facilities set forth in this section, except as otherwise provided in Section 6 of the Agreement.

The parties acknowledge that the Agency and the County have entered into an agreement (the "Solid Waste Service Agreement") whereby the **Agency** agrees to provide or cause to be provided to the facilities of the System **for management of** Solid Waste and Regulated Recyclable Materials generated in or coming into the County. The Agency agrees to provide and operate the System and accept Solid Waste and Regulated Recyclable Materials at the facilities of the System. In consideration of this service, **and upon the effective date of the Solid Waste Service Agreement,** the County will pay, if required, "Net Service Fees" as defined in the Solid Waste Service Agreement. A copy of the Solid Waste Service Agreement is annexed hereto as Exhibit "5".

Section 3. The Agency's Service Obligations

During the term of this Agreement the Agency shall be responsible for, and will provide, or cause to be provided through the System, the service of accepting, processing, and/or disposing of Solid Waste and accepting, processing, and marketing of Regulated Recyclable Materials.

The Agency shall not accept, at the Landfill, any (i) hazardous waste as defined in Part 371 of Title 6 of the New York Code of Rules and Regulations that is required to be managed at a facility subject to regulation under Part 373 or 374 of Title 6 of the New York Code of Rules and Regulations; (ii) low-level radioactive waste that is required to be disposed of at a land disposal facility subject to regulation under Part 382 of Title 6 of the New York Code of Rules and Regulation; (iii) asbestos waste as defined in Section 360-1.2(b)(12) of Title 6 of the New York Code of Rules and Regulations unless said asbestos waste is removed and packaged in accordance with 40 CFR Part 61, Sub Parts A and M. 29 CFR Part 1910, and Section 360-2.17(m) of Title 6 of the New York Code of Rules and Regulations; ^ (iv) infectious waste as defined in Section 360-1.2(b)(8) of Title 6 of the New York Code of Rules and Regulations; and any other material not authorized by state or federal law, rule or regulation to be disposed of at the Landfill. The Agency will take all necessary steps to prevent the disposal of the materials described in this paragraph at the Landfill, and will be responsible for the costs of removing any

such materials wrongfully disposed of there and remediating the Landfill in accordance with applicable state or federal law, rule, regulation, or administrative order. Nothing herein shall prevent the Agency from proceeding against any party which has disposed, or attempted to dispose of such materials at the Landfill for damages or other remedies.

The Agency and the Town shall notify each other in writing immediately after receiving any notice or advice from any governmental entity or other party with respect to any violation of federal, state or local laws, rules or regulations affecting the Landfill.

The obligations of the Agency pursuant to this Section shall survive the expiration or earlier termination of the Agreement.

Section 4. The Agency's Fees and Charges

The Agency shall establish and from time to time amend such fees and charges as it deems necessary and proper to pay for the costs of the System and providing the service under this Agreement, including a tipping fee at the Agency's facilities. The tipping fee shall be established on an annual basis. The Agency shall announce the proposed annual tipping fee for the next year by September 10th of each year. The Agency shall notify the Town in writing and shall schedule a hearing on the fee upon 15 days written notice to the Town. The Agency shall establish the tipping fee no later than October 15th of each year. Nothing herein shall

prevent the Agency from increasing the tipping fee during any fiscal year to meet increased expenses or shortfalls in revenues, provided that the Agency shall notify the Town in writing of such increase at least 30 days before it takes effect. The Agency agrees that the initial fee to be charged for the first year shall not exceed $_____ per ton. The fees and charges shall be collected from all users of the System. Notwithstanding the above, and in order to encourage recycling, the Agency agrees that it will establish no fee or charge for residential recycling of Regulated Recyclable Materials for three years from the effective date of this Agreement. The Agency agrees to take all reasonable steps to provide residential recycling at no charge or fee during the balance of this Agreement, as well. A fee or charge may be established for commercial and institutional recycling of Regulated Recyclable Materials. For the purposes of this Agreement, the terms "residential", "commercial" and "institutional" shall have the same meaning as set forth in Local Law No. 8 of 1991.

Section 5. The Town's Obligation to Deliver Solid Waste and Regulated Recyclable Materials

The Town shall take Appropriate Action to deliver or cause to be delivered all Solid Waste and Regulated Recyclable Materials generated in or originating in the Town to a Solid Waste management facility designated by the Agency. Any such Solid Waste management facility shall be located in the County. For the purposes of this section, the term "Appropriate Action" shall mean

and include the following:

a) the establishment of the municipal drop-off center as provided in Section 7 of the Agreement;

b) the exercise by the Town of its best efforts to encourage its citizens who self-haul Solid Waste and Regulated Recyclable Materials to utilize the municipal drop-off center;

c) delivery of all Solid Waste and Regulated Recyclable Material generated by the Town's operations to the Landfill, ^ municipal drop-off center, or satellite aggregation center;

d) refraining from interfering with the Agency's receipt of Solid Waste deposited in the Solid Waste roll-off or other proper receptacle, or Regulated Recyclable Materials at the municipal drop-off center, but nothing herein shall restrict the Town's authority to deal with non-regulated recyclable materials;

e) exercising best efforts to encourage private haulers of Solid Waste and Regulated Recyclable Materials in the Town to dispose of Solid Waste or Regulated Recyclable Materials at facilities designated by the Agency in accordance with the Solid Waste Management Plan;

f) cooperating with and assisting the Agency and the County Health Department in their efforts to enforce laws, rules and regulations governing the disposal of Solid Waste and delivery of Regulated Recyclable Materials in the Town;

g) taking such other steps as the parties may mutually agree upon, including, after the exercise of its legislative and police powers and pursuant to and in accordance with the State

Constitution, Town Law and other statutory authority, **consider** the adoption of local laws, ordinances, rules or regulations providing, among other things, for the collection and disposal of Solid Waste and the collection and processing of Regulated Recyclable Materials at facilities designated by the Agency pursuant to the Solid Waste Management Plan.

The Town may, if lawful, delegate to the Agency the responsibility of implementing and enforcing the Appropriate Action described in "g" above. The Agency shall accept such delegation.

Section 6. The Town's Operating Obligation

The Town shall designate a location within the Town or jointly designate with other municipalities in the County, an area to be used as a municipal drop-off center for Solid Waste and Regulated Recyclable Materials. The purpose of the municipal drop-off center is to provide the option of self-hauling of Solid Waste and Regulated Recyclable Materials by residents of the Town. The Agency shall provide the Town with assistance in designing the municipal drop-off center. The Town agrees that the municipal drop-off center shall be designed and constructed to allow for easy access by the Agency's equipment and vehicles and the residential users. The Agency shall provide roll-off boxes and related equipment for use at the municipal drop-off center as the Agency and Town deem necessary. Equipment provided by the Agency shall remain the property of the Agency. The Agency shall pay for the roll-offs, compactor roll-offs and related equipment to be used at

the municipal drop-off center. **In addition,** the Agency shall pay the costs to design, renovate, or construct the municipal drop-off center, up to a maximum of $40,000.00. **These costs shall be paid from the Agency's bond issue.** The Town shall operate and maintain, at its expense, the municipal drop-off center during the term of this agreement. The Town shall retain the right to set charges and fees for use of the municipal drop-off center as it deems appropriate, except that so long as the Agency is providing to residential users the service of receiving, processing and marketing Regulated Recyclable Materials at no charge or fee, the Town shall not establish a charge or fee for the receipt of Regulated Recyclable Materials from residential users of the Town at the municipal drop-off center.

The Agency shall pull roll-off boxes from the municipal drop-off center using its own agents or staff and equipment, or through contract, and shall transport the Solid Waste to Agency facilities for processing or disposal and Regulated Recyclable Materials to Agency's facilities for processing and marketing. The Town shall pay, subject to limitations set forth in Section 4 hereof the charge or fee established by the Agency for such service.

The Agency and the Town agree that the municipal drop-off centers shall be operated and maintained in accordance with the performance standards annexed hereto as Exhibit "1".

The Town shall notify the Agency in writing immediately after receiving any notice or advice from any governmental entity

or other party with respect to any violation of federal, state or local laws, rules or regulations affecting the municipal drop-off center.

Section 7. Municipal Yard Waste Composting and Clean Wood Waste Handling Program

The Agency has established a municipal yard waste composting and clean wood waste handling program ("MCP"). The terms and conditions of the MCP are annexed hereto as Exhibit "2". The Town agrees to participate in and comply with the MCP in accordance with those terms and conditions. The Town may satisfy this obligation by jointly agreeing with another municipality to participate in the program.

Section 8. Maximization of Reduction, Reuse and Recycling Initiatives

It is the intent of the Agency and the Town in entering into this Agreement to maximize the reduction, reuse, and recycling of materials. The Agency agrees to provide, pursuant to the Plan, a vigorous education program to encourage the inhabitants of the Town to reduce, reuse, and recycle materials to the maximum extent possible. The Agency's role shall be primary, but the Town agrees to participate in the Agency's education program and to encourage its inhabitants to participate in reduction, reuse and recycling.

Section 9. Use of Existing Landfill by Agency

The Town agrees to lease to the Agency the footprint of

its existing landfill site, plus a thirty-foot buffer zone around the footprint, and an area sufficient for a scale and scalehouse as delineated in the attached Exhibit "3" (the "Landfill"), for the term of this Agreement. The Agency shall obtain a survey of such area at its own cost. The Agency shall have the right to use the Landfill for the purposes of disposing of Solid Waste generated within or originating in the County. Solid Waste shall only be disposed of on the existing footprint. The buffer zone shall be used only to provide an area of separation between the Landfill footprint and adjacent property. Monitoring wells, roads, environmental systems, the scale or scalehouse may also be located in the buffer zone. The Agency shall designate the Landfill to receive Solid Waste from the various municipalities of the County as provided for in the rules and regulations adopted pursuant to Local Law No. 9 of 1991 or any agreement between the Agency and such municipality.

The Agency acknowledges that it has made an assessment of the condition of the Landfill. The Town acknowledges that the Agency has relied in part on information and studies provided to the Agency by the Town and upon the representation of the Town set forth in Section 15(g) of this Agreement ^ **that it has supplied to or made available to the Agency all relevant documentation concerning the Landfill.** The Agency accepts the Landfill "As Is".

The Agency shall, at its own expense: a) undertake such renovation, upgrade, and other capital expense necessary to operate the Landfill for the purposes of this Agreement; b) operate the

Landfill; and c) close the Landfill and monitor closure pursuant to the modified consent order referred to below. The Agency shall have the right to construct and install, purchase or lease a scale house and scale on or near the Landfill for the purpose of weighing all Solid Waste to be received at the Landfill. The Agency shall operate and maintain the scale at its own expense. The Agency shall also have the right to construct such other buildings, or use such existing buildings at the Landfill as the Agency and Town shall agree. The Agency shall maintain any such buildings at its own expense.

The lease of the Landfill to the Agency shall become effective upon the execution of a modified consent order by and among the Agency, the Town and NYSDEC, which consent order shall provide for the Agency's assumption of responsibilities for the landfill, the operation of the landfill during the permitted period of operation, including provision for an on-site part-time monitor from NYSDEC, the closure of the landfill after operations cease, and the monitoring of such closure all at the cost of the Agency. The obligation to monitor closure shall survive the term of the Agreement. The Agency and the Town agree to comply with the terms of the modified consent order.

The Town hereby leases the Landfill to the Agency for the amount of $1.00 and the consideration that the Agency shall undertake the upgrading, renovation, operation, closure, and monitoring of the landfill at its own cost and expense.

The Agency shall dispose of Solid Waste only on the

existing footprint portion of the Landfill, as defined by this Agreement. The Agency will observe all applicable regulations with regard to Landfill elevation and slope, but in no event shall the maximum height of the Landfill exceed a three-to-one slope or _____ feet. The Agency shall use the footprint of the Landfill until the footprint reaches capacity under 6 NYCRR Part 360, the Agency's County-wide 6 NYCRR Part 360 landfill is operational, or until January 1, 1996, whichever first occurs.

The Agency shall provide daily cover for the Landfill and shall utilize a clay material to cover each layer of Solid Waste. The Agency agrees to direct vehicles hauling Solid Waste into the Town from other municipalities within the County to use specified State roads until they reach the access road to the Landfill.

The Agency hereby hires the Town to operate the landfill on behalf of the Agency in accordance with the terms and conditions set forth in Exhibit "4" to this Agreement. The Town hereby agrees to perform such service in accordance with the terms and conditions in Exhibit "4" and agree to accept, as full compensation for the operation of the Landfill, the compensation provided in Exhibit "4".

Upon the expiration or earlier termination of the term of this agreement, the Agency shall surrender and deliver the Landfill to the Town "As Is", in such condition as required by the Modified Consent Order. The Agency shall prepare, or have prepared by its engineering or environmental consultants a base line monitoring report, and shall provide such report to the Town prior to

surrender of the Landfill property. The Agency shall remove from the Landfill on or prior to such expiration or earlier termination, all of its Property and shall repair any damage caused by such removal. Property not so removed may, at the option of the Town, be deemed to have been abandoned by the Agency and either may be retained by the Town as its property or be disposed of without accountability, in such manner as the Town may see fit, or if the Town shall give written notice to the Agency to such effect, such property shall be removed by the Agency at the Agency's sole cost and expense. If the Agency shall fail to remove such property, the Agency shall reimburse the Town upon demand for the reasonable costs incurred by the Town in effecting such removal.

The Agency agrees to establish an escrow account to be entitled "Landfill Clos[illegible] Fund - Town of **Wawarsing** Landfill" Escrow funds shall be held by an independent trustee and the terms of the trust shall provide, among other things, that the funds shall first be used to pay for the expenses to close and monitor closure of the landfill pursuant to the modified consent order. Any surplus shall be paid to the Agency. The Agency shall pay a portion of its revenues into such fund on a monthly basis. Payment to the fund shall be made wi[illegible] thirty (30) days after receipt of revenues. The Landfill Closure Fund shall [illegible] in the modified order on consent. The amount to placed in the Landfill Closure Fund shall be not less than $**.00 per ton of Solid Waste disposed of at the Landfill and beginning January 1, 1993 shall be not less than $ 00,000.00 per year, until such time as the

Landfill is closed and closure is accepted by NYSDEC. Thereafter, the Agency shall collect and deposit in the escrow fund monies sufficient to pay for post-closure supervision and monitoring of the Landfill, **and for the purposes of ^** a contingency fund. The amount and duration of the contingency fund shall be mutually agreed upon by the parties at the time closure is completed. The purpose of the contingency fund shall be to provide the Agency with monies to be used solely to correct problems at the landfill site, or to pay the costs the Agency may be obligated to pay pursuant to Section 12 of this Agreement.

Except for surrender upon the expiration or earlier termination of the term of the Agreement, no surrender to the Town of the Landfill shall be valid or effective unless agreed to and accepted in writing by the Town.

In the event that the authority of the Agency to act is canceled by Judicial Decree, Legislative enactment or otherwise, the Agency shall vacate the Landfill immediately. In addition to any other legal remedies the Town may have, any funds on deposit in the Escrow Account shall be transferred to the Town and the Agency shall forfeit any claim to said fund, if any claim ever existed.

The Agency, its successors and assigns agree that it has no intention to utilize the Landfill for any purpose other than that described herein. It further agrees that it will take no steps whatsoever to designate the Landfill as the "County-wide Part 360 Landfill" described in the Solid Waste Management Plan, to seek a permit for such purpose from the Department of Environmental

Conservation, or to exercise the powers of eminent domain over the Landfill property. ^

The Town shall notify the Agency in writing immediately after receiving any notice or advice from any governmental entity or party with respect to any violation of federal, state or local laws, rules or regulations affecting the Landfill.

Section 10. Insurance

The Agency shall obtain and maintain at its own expense throughout the term of this Agreement and during the monitoring period, insurance to the extent commercially available, ^ to cover the properties and the liabilities of the Agency. **The determination of commercial availability of insurance shall be made initially by the Agency and written evidence of such determination shall be sent to the Towns. If the Town disputes such determination, it shall advise the Agency in writing within 30 days of receipt of the notice of determination. The parties shall then present the issue to binding arbitration dispute resolution under the rules and procedures of the American Arbitration Association. If the Town does not respond with the thirty day period after actual receipt of the written determination, the determination of the Agency will become final.** The Town shall be named as an additional Insured. The Town shall maintain insurance coverage in the same amount set forth in (a) and (b) below covering its operation of the Landfill. **The cost of the insurance to be provided by the Town for landfill operation shall be borne by the Agency pursuant to Exhibit "4" hereof.** The Agency shall be named as an additional Insured on

the Town's policy.

The insurance policies shall be obtained from a good and solvent insurance company or companies licensed to do business in the State of New York. The insurance policies shall include the following:

(a) a comprehensive general liability insurance with broad form extension for personal injury, death and/or property damage in limits of not less than Two Million Dollars combined single limits; and

(b) a commercial comprehensive catastrophe liability umbrella policy for personal injury, death and/or property damage in limits of not less than Ten Million Dollars; and

(c) an environmental impairment liability policy for spill insurance including pollution incidents of every kind and nature, including, but not limited to, sudden and/or slow and/or gradual seepage and/or discharge pertaining to any petroleum products, asbestos and any other materials set forth in the definitions of solid waste and hazardous substances in the amount of Two Million Dollars per single loss with an aggregate coverage of Four Million Dollars in a single year. The loss insured against shall include, but not be limited to any violation of law, rule or regulation under CERCLA, Navigation Law, Oil Spill Act, Clean Water Act, Toxic Substances Control Act and RCRA. Said policy shall include coverage for cleanup costs.

The Agency shall furnish the Town with a duplicate

original copy of each of the aforesaid insurance policies provided for above and shall provide the Town with the renewals thereof, when due, during the term of this lease and ^ the monitoring period.

Section 11. Reports

The Agency shall report on a quarterly basis to the Town with respect to such matters relating to the operation and maintenance of the System and the administration of this Agreement, including: (i) the number of gross tons of Solid Waste or Regulated Recyclable Materials delivered to the System; (ii) the quantity of Solid Waste disposed of and Regulated Recyclable Materials processed and sold; (iii) the types and quantity of wastes which were refused acceptance for disposal or processing; and (iv) the amount and price of Regulated Recyclable Materials sold and other revenues.

Section 12. Indemnification with Respect to System Operation The Agency agrees that it will protect, indemnify, and hold harmless the Town and its officers, employees and agents (collectively, the "Indemnified Parties") from and against **any and** all losses, liabilities, actions, damages, claims, **penalties**, demands, **fines**, judgments, ^ costs, expenses, expert witness fees, sums paid in settlements, suits or actions and attorneys' fees, and will defend the Indemnified Parties in any suit, including appeals, for personal injury to, or death of, any

person or persons, or loss or damage to property arising out of the operation of the System, including, but not be limited, to any violation of law, rule or regulation under CERCLA, Navigation Law, Oil Spill Act, Clean Water Act, Toxic Substances Control Act and RCRA or the performance (or non-performance) of the Agency's obligations under this Agreement. The Agency shall not, however, be required to reimburse or indemnify any Indemnified Party for a loss or claim: 1) due to the gross negligence or willful misconduct of any Indemnified Party, and the Indemnified Party whose gross negligence or willful misconduct is adjudged to have been the primary cause of such loss or claim will reimburse the Agency for the costs of defending any suit as required above; or 2) relating to the Landfill or operations thereof arising, accruing, or based upon conditions existing on or prior to the effective date of this Agreement, provided, however, that the parties have obtained from an independent engineer selected by the parties **and compensated ^ from the Escrow Fund, subject to reimbursement by the Agency**, a written opinion conclusively showing that the loss or claim arose, accrued or was based upon a condition existing prior to this Agreement. An Indemnified Party shall promptly notify the Agency of the assertion of any claim against it for which it is so entitled to be indemnified, shall give the Agency the opportunity to defend such claim, and shall not settle such claim without the approval of the Agency. These indemnification provisions are for the protection of the Indemnified Parties only and shall not establish, of themselves, any liability to third parties. The

provisions shall survive termination of the agreement but shall continue in force and effect for no longer than the period of limitation for any action.

Section 13. Notice of Litigation

The Town shall deliver written notice to the Agency of any litigation or similar proceeding to which the Town shall be a party and which shall question the validity or enforceability of this Agreement. The Agency shall ^ defend any such litigation or proceeding, or pay the costs thereof.

Section 14. Default

(a) Default by the Agency

The occurrence of any of the following shall constitute a default by the Agency:

(1) A failure on the part of the Agency to pay the monthly installment into the escrow account established pursuant to the Agreement; and

(2) The failure on the part of the Agency to maintain insurance as agreed; and

(3) The failure on the part of the Agency to observe or perform any of the other terms of this Agreement on the part of the Agency to be observed and performed; and

(4) The cancellation of the Agency's power to act by judicial decree, legislative enactment or otherwise; and

(5) The filing of a petition in bankruptcy or the

petition for any other relief from creditors under any Federal or State law, as well as an assignment for the benefit of creditors, or the appointment of a Receiver.

In the event of any default as set forth in this paragraph above, the Town must give written notice to the Agency calling attention to the existence of such failure. If the failure is not cured within twenty (20) days after notice thereof, then the Town may without notice re-enter the demised premises either by force or otherwise and dispossess the Agency by summary proceedings or otherwise and the Agency shall remove its effects from the premises and the Agency hereby waives the service of notice of intention to re-enter or to institute legal proceedings to that end and the Town shall have all other remedies provided by law or equity or contract.

In the case of any default, re-entry or dispossess by summary proceedings or otherwise:

(i) the payments into the escrow account shall be due thereupon and shall be paid to the Town, provided that the Town shall use those escrow funds to pay for the closure of the Landfill; and

(ii) the costs of re-entry and litigation, including attorney's fees and expenses in putting the demised premises in good order, or preparing the same for resumption of operation by the Town or otherwise, shall be an item of damage.

(iii) the Town has no obligation to resume operation of the Landfill or to obtain another entity to operate the same.

(iv) the Town may recover against the Agency any legal money damages or costs and expenses permitted in an action at law or equity as may be justified under all the circumstances.

(b) Default by the Town

The failure on the part of the Town to observe or perform any of the other terms of this Agreement on the part of the Town of be observed and performed shall constitute a default hereunder.

In the event of any default as set forth in the paragraph above, the Agency must give written notice to the Town calling attention to the existence of such failure. If the failure is not cured within twenty (20) days after notice thereof, then the Agency may institute legal or equitable proceedings as it deems proper. The Agency shall have all remedies provided by law or equity or contract, including money damages or costs and expenses permitted in an action at law or equity as may be justified under all the circumstances.

Section 15. Representations and Warranties

The Agency represents and warrants that:

(a) The Agency has the full power and authority to execute and deliver this Agreement and to perform its obligations hereunder; the execution, delivery and performance of this Agreement by the Agency has been duly and validly authorized; and all requisite corporate action has been taken by the Agency to make this Agreement valid and binding upon the Agency enforceable in accordance with its terms;

(b) The Agency's execution of, and compliance with, this

Agreement are in the ordinary course of business of the Agency and will not result in the breach of any term or provision of the charter or by-laws of the Agency or result in the breach of any term of provision of, or conflict with or constitute a default under or result in the acceleration of any obligation under, any agreement, indenture or loan or credit agreement or other instrument to which the Agency is subject, or result in the violation of any law, rule, regulation, order, judgment or decree to which the Agency is subject;

(c) There is no action, suit proceeding or investigation pending or threatened against the Agency which, either in any one instance or in the aggregate, may result in any material adverse change in the business, operations, financial condition, properties or assets of the Agency, or in any material impairment of the right or ability of the Agency to carry on its business substantially as now conducted, or in any material liability on the part of the Agency, or which would draw into question the validity of this Agreement or of any action taken or to be taken in connection with the obligations of the Agency contemplated herein, or which would be likely to impair materially the ability of the Agency to perform under the terms of this Agreement; except the action entitled Town of Saugerties and Winston Farm Alliance, Inc. vs. County of Ulster, Ulster County Resource Recovery Agency and State of New York, Index No. 92-1487; and

(d) The Agency does not believe, nor does it have any reason or cause to believe, that it cannot perform each and every

covenant contained in this Agreement;

(e) No approval, authorization, order, license or consent of, or registration or filing with, any governmental authority or other person, and no approval, authorization or consent of any other party is required in connection with this Agreement; except approvals of the New York State Department of Environmental Conservation.

(f) This Agreement constitutes a valid, legal and binding obligation of the Agency, enforceable against it in accordance with the terms hereof.

The Town represents and warrants that:

(a) The Town has the full power and authority to execute and deliver this Agreement and to perform its obligations hereunder; the execution, delivery and performance of this Agreement by the Town has been duly and validly authorized; and all requisite corporate action has been taken by the Town to make this Agreement valid and binding upon the Town, enforceable in accordance with its terms;

(b) The Town's execution of, and compliance with, this Agreement are in the ordinary course of business of the Town and will not result in the breach of any term or provision of the charter or by-laws of the Town or result in the breach of any term or provision of, or conflict with or constitute a default under or result in the acceleration of any obligation under any agreement, indenture or loan or credit agreement or other instrument to which the Town is subject, or result in the violation of any law, rule,

regulation, order, judgment or decree to which the Town is subject;

(c) There is no action, suit, proceeding or investigation pending or threatened against the Town which, either in any one instance or in the aggregate, may result in any material adverse change in the business, operations, financial condition, properties or assets of the Town, or in any material impairment of the right or ability of the Town to carry on its business substantially as now conducted, or in any material liability on the part of the Town, or which would draw into question the validity of this Agreement or of any action taken or to be taken in connection with the obligations of the Town contemplated herein, or which would be likely to impair materially the ability of the Town to perform under the terms of this Agreement;

(d) The Town does not believe, nor does it have any reason or cause to believe, that it cannot perform each and every covenant contained in this Agreement;

(e) No approval, authorization, order, license or consent of, or registration or filing with, any governmental authority or other person, and no approval, authorization or consent of any other party is required in connection with this Agreement; except the New York State Department of Environmental Conservation;

(f) This Agreement constitutes a valid, legal and binding obligation of the Town, enforceable against it in accordance with the terms hereof.

(g) The Town has operated the Landfill as a disposal

area for Solid Waste since _____ pursuant to and in compliance with applicable federal, state and local laws, rules and regulations and orders. ^

Section 16. Condition Precedent

This Agreement shall not take effect or become legally binding upon the parties unless and until the following condition precedent is first satisfied:

^

A) The Modified Consent Order is executed by NYSDEC, the Town and the Agency.

Section 17. Term of Agreement

This Agreement shall be in full force and effect and be legally binding upon the Agency and the Town from the date of the execution and delivery hereof and the satisfaction of the Conditions Precedent set forth in Section 16 hereof. This Agreement shall remain in full force and effect through September 1, 2002, and may be renewed by mutual agreement of the parties for an additional 10 year period, except that the obligation to monitor shall continue after the termination of this Agreement. Notwithstanding anything in this section to the contrary, this Agreement shall remain in full force and effect as long as any bonds issued by the Agency in accordance with the Act and the Service Agreement with the County to finance the System remain outstanding or until adequate provision is made for the payment or

satisfaction thereof, whichever is later.

Section 18. Amendment of Agreement.

This Agreement may be amended, waived, modified, and supplemented only by agreement of the parties. Any amendment to this Agreement so consented to as provided above shall be by written agreement, duly authorized and executed by the Agency and the Town.

Section 19. Notices

Any notice or communication required or permitted hereunder shall be in writing and sufficiently given if delivered in person or sent by certified or registered mail, postage prepaid, as follows:

If to the Town: **Town of Wawarsing**
Attention: Supervisor
108 Canal Street, P. O. Box 671
Ellenville, New York 12428

If to the Agency: Ulster County Resource Recovery Agency
Attention: Executive Director
52 Main Street, UPO Box 4298
Kingston, New York 12401

Changes in the respective addresses to which such notices may be directed may be made from time to time by any party by notice to the other party.

Section 20. Severability

If any provision of this Agreement shall for any reason

be held to be invalid or unenforceable, the invalidity or unenforceability of such provision shall not effect any of the remaining provisions of this Agreement and this Agreement shall be construed and enforced as if such invalid and unenforceable provision had not been contained herein.

Section 21. Execution of Documents

This Agreement may be executed in any number of counterparts, any of which shall be regarded for all purposes as an original and all of which shall constitute but one and the same instrument. Each party agrees that it will execute any and all deeds, documents or other instruments, and take such other action as is necessary to give effect to the terms of this Agreement.

Section 22. Non-Assignability

Except as expressly provided in this Section 21, no party to this Agreement may assign or encumber any interest herein to any person without the consent of the other party hereto, and the terms of this Agreement shall inure to the benefit of and be binding upon the respective successors or assigns of each party hereto. The parties hereto retain the right to reorganize and to have any other body corporate and politic succeed to the rights, privileges, powers, immunities, liabilities, disabilities, functions and duties of either party hereto, as may be authorized by law, in the absence of any prejudicial impairment of any obligation of contract hereby imposed. The Agency may assign its rights hereunder to a trustee

established pursuant to any trust indenture relating to bonds issued to finance the system as security as may be required in connection with the issuance of the bonds. The Town specifically consents to the foregoing assignment.

Section 23. Entirety

This Agreement merges and supersedes all prior negotiations, representations and agreements between the parties hereto relating to the subject matter hereof and constitutes the entire agreement between the parties hereto in respect thereof, all prior negotiations, representations and agreements, whether oral or written, having been merged herein.

Section 24. Waiver

Unless otherwise specifically provided by the terms of this Agreement, no delay or failure to exercise a right resulting from any breach of this Agreement will impair such right or shall be construed to be a waiver thereof, but such right may be exercised from time to time and as often as may be deemed expedient. Any waiver must be in writing and signed by the party granting such waiver. If any covenant or agreement contained in this Agreement is breached by any party and thereafter waived by any other party, such waiver will be limited to the particular breach so waived and will not be deemed to waive any other breach under this Agreement.

Section 25. Governing Law and Jurisdiction

This Agreement shall be governed by and construed in accordance with the laws of the State.

Section 26. References and Headings

Except as otherwise indicated, all references herein to Sections are to Sections of this Agreement. Section headings herein have been inserted for convenience of reference only and will not limit, expand or otherwise affect the construction of this Agreement.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized officers or representatives as of the day and year first above written.

ULSTER COUNTY RESOURCE RECOVERY AGENCY

BY:_____
TITLE:

TOWN OF

BY:_____
TITLE:

EXHIBIT "4"

Terms and Conditions for and Operation of the Town of New Paltz Landfill

1. Hours. The Landfill will be open Mondays through Saturdays at such hours to be agreed upon by the Agency and Town, but no less than 7 hours Monday through Friday and 4 hours on Saturday. The Landfill will be closed on legal holidays in New York.

2. Access. Only persons with a license issued by the Agency will be able to use the Landfill. Licenses will be issued in accordance with the by-laws to be adopted by the Agency.

3. Scale and Scale House. The Agency shall construct, own, and operate the Scale and Scale House. No person shall use the Landfill unless weighed in at the Scale before tipping and weighed out at the scale after tipping.

4. Billings. All billings shall be made by the Agency. Failure to pay bills on a current basis may be grounds for refusal of use of the Landfill. The Agency shall establish rates, penalties, payment periods and other billing procedures in its by-laws.

5. Host Community Payment. The Town shall receive, as a host community, the sum of $1.25 for each ton of Solid Waste disposed of at the Landfill, of which $.25 shall be paid by the Town to the appropriate entity responsible for fire protection. These payments shall be made by the Agency on a semi-annual basis, the first payment being made on January 1, 1993.

6. Solid Waste to be Received at the Landfill. The Agency agrees that in the event of an emergency or on a temporary basis, the Agency will receive at the Landfill Solid Waste only from the following municipalities:

The Agency shall notify the Supervisor of any condition which requires the receipt of Solid Waste from other that the above municipalities.

OPERATING PROCEDURES

7. General. The Town shall operate the Landfill on behalf of and under the general supervision and technical direction of the Agency.

8. Personnel. The Landfill employees shall remain Town employees and shall continue to receive benefits and salaries including unemployment, worker's compensation and insurance benefits pursuant to collective bargaining agreements or resolutions of the Town. At no time shall the employees be considered employees of the Agency. The compensation and benefits of the Landfill employees shall not be increased or decreased because of the Agency's leasing of the Landfill. Increases in salaries and benefits shall not exceed those granted by the Town to its other employees.

The overall direction and control of landfill operations shall be vested in the Agency's Operations Manager, who will supervise day to day operations. Both parties will cooperate with any monitor appointed by NYSDEC to oversee landfill operations.

Any request for personnel reassignments or other changes by the Agency shall be made to the Supervisor. The Supervisor shall be responsible for personnel administration and for assigning a sufficient number of employees for the landfill operations.

The Town will provide two Heavy Equipment Operators for operation of the Landfill. Most of their activity would be in operating equipment on the Landfill. This coverage would be for 8 hours Monday - Friday and 4 hours on Saturday. While two employees would be assigned, the Town of New Palt- w[illegible] only guarantee one person during hours of operatio[illegible], as an average employee has the potential of 46 days off pe[illegible]y contract (12 sick, 3 bereavement, 3 persona[illegible]ays and 15 vacation). The Town would [illegible] one person Saturday AM and one other half a day at the Agency's option.

Adjustments would be made each six months in regards to days worked versus projected and the Town would either credit the Agency with days or charge for additional days at the hourly rate of $12.67 (1992 HEO hourly rate).

Example: 26 weeks X 80 hours = 2,080 hours
1,080 minus 368 = 1,712

If employees actually worked more than 1,712 hours the Agency would pay additional monies at $12.67 per hour and if less the Town would owe the Agency monies.

All overtime (over 8 hours per day or over 40 hours per week) would only be authorized by the Agency in advance. If the Town required overtime to cover an emergency absence, it would at Town expense.

In addition, the Agency would pay for all payroll benefit costs including but not limited to medical, dental, unemployment compensation, disability, retirement, FICA,

medicare, etc. This is projected to be approximately 35% of wages. Also, the Agency would be responsible for any required safety equipment, safety or other training, and physicians (if required).

In the event that an employee is terminated upon the Agency's request, any associated ancillary expenses are the Agency's responsibility. The Agency will have initial approval for any persons working on the Landfill.

The Agency may request additional staffing on the same basis. A yearly pro-rated management/bookkeeping fee of $7,500.00 per year will be charged to the Agency. The Contract can be renegotiated initially after six months and every year thereafter. Hourly rates will be modified based on negotiated contract between the Town and their union or employees but the percent increase will not be greater than that of similar positions, such as Highway within the Town.

9. Rejected Loads. If any person attempts to dispose of material which does not conform to the definition of Solid Waste set forth in the Agreement, and it is determined by landfill operators to reject the load, the Landfill Manager shall inform the Town Supervisor and the Agency Operations' Manager who shall agree on methods to be taken to rectify the problem. A rejected load shall be reloaded onto the collection vehicle which shall be directed to the appropriate disposal site by the Agency. The Agency may charge a fee for the cost of reloading a rejected load.

10. User List. The Agency shall provide to the Town and keep current at all times a list of persons licensed to use the Landfill. Neither the Agency nor the Town shall permit the use of the Landfill by persons not fully licensed. The Town shall have no authority to use or allow anyone else to use the landfill, except in accordance with this Agreement.

11. Compliance With Regulations. The Agency and the Town shall comply with the terms and conditions for operation of the landfill set forth in the consent order and 6 NYCRR Part 360.

12. Closure. The Agency shall be responsible for preparing, implementing and monitoring the closure plan required by the consent order. The Town's employees may continue to be used for providing support for closure activities pursuant to this Agreement. The Agency shall select and employ professional engineers in connection with closure.

13. Equipment. The Town and the Agency shall agree on the equipment necessary to operate the landfill. The Town and Agency currently agree that the 1989 Crawler Loader presently used at the Landfill shall be leased by the Agency at the rate of $750 per week plus fuel and oil. It shall be used only for Landfill operations. The Town shall be responsible for repairs and the Agency's rental payment would be reduced if

the equipment is out of service.

The Agency shall obtain, at its own cost and expense, additional equipment as mutually agreed and shall replace existing equipment as required. The Town shall operate and maintain the equipment, utilizing it only for Landfill operations.

14. Materials. The Agency shall order and pay for all materials and supplies used at the Landfill unless otherwise agreed by the parties.

15. The Town shall maintain and plow the access road to the landfill at its own expense.

16. Liaison Committee. The Agency and the Town agree to establish a liaison committee consisting of a member of the Agency, the Executive Director and Operations Manager, the Town Supervisor, a member of the Town Board and the Landfill Manager. The committee shall be convened at the request of either party on an ad hoc basis to discuss problems and issues which arise during the operation of the landfill. The purpose of the committee is to resolve matters informally through communication, avoiding the necessity of formal action to resolve disputes.

17. Billing. The Town will provide reports of materials and supplies expended and time spent by designated employees on a monthly basis, on forms to be approved by the Agency. The Town shall submit a monthly voucher for payment. The Agency shall pay the voucher upon audit and approval with 30 days of receipt.

Attachment D.

Modified
Orders on Consent
Form

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of the Modification of an Order on Consent dated April 24, 1987,

by

MODIFIED ORDER ON CONSENT

Case #3-1256-8607

TOWN OF ULSTER and ULSTER COUNTY RESOURCE RECOVERY AGENCY,

Respondents.

WHEREAS:

1. The Department of Environmental Conservation (hereinafter "the Department" or "DEC") regulates Solid Waste Management Facilities pursuant to Article 27, Title 7 of the ECL.

2. Respondent Town of Ulster ("Respondent Town") is currently responsible for a solid waste management facility, as that term is defined in Section 360-1.2(b)145 of 6 NYCRR, in the Town of Ulster, County of Ulster, State of New York (the "Facility"). The term "Respondents" as used herein, shall refer to both names Respondents, jointly and severally, unless otherwise indicated.

3. Respondent Ulster County Resource Recovery Agency ("UCRRA") has been created pursuant to Title 13-G of the Public Authorities Law to, inter alia, manage solid waste in Ulster County. Respondent UCRRA has prepared and the DEC has approved a Solid Waste Management Plan ("SWMP"). Subsequently the SWMP has been modified to include a Landfill Consolidation Plan ("LCP") as an interim disposal method for Ulster County. The LCP has been approved by the Department. The LCP proposes the orderly and timely closure of existing non-complying landfills in the County. Solid waste is to be directed from the closed facilities to three "consolidation landfills" which shall serve as solid waste disposal facilities until they reach capacity or are closed under this Order, whichever is sooner. Respondent UCRRA has entered into an agreement with Respondent Town to lease the landfill and operate it as a consolidation landfill in accordance with the agreement and this Consent Order. Pursuant to the Agreement, Respondent UCRRA will be responsible for all obligations to be performed pursuant to this Consent Order, including the closure and monitoring of the landfill in accordance with this Consent Order.

4. Respondents and the DEC have agreed that the landfill shall be closed pursuant to the requirements of 6 NYCRR Part 360, effective December 31, 1988.

5. Respondent Town entered into an Order on Consent on April 24, 1987 with the DEC regarding various alleged violations of the ECL and 6 NYCRR at the Respondent Town's Facility.

6. Pursuant to the original Order on Consent of April 24, 1987 and the LCP, the Department has determined that a schedule for orderly phase-out of the existing landfills in Ulster County may allow for the continued operation of three of the landfills in Ulster County, including the Facility, for a limited period.

7. Consistent with the modified SWMP, the Respondent Town has requested a modification of the original Order on Consent in order to implement the SWMP and the LCP.

8. In 1987, the Department of Environmental Conservation entered into Orders on Consent with a number of municipalities in the County of Ulster, including Respondent Town. Pursuant to those Orders, each municipality operating an unpermitted active landfill in the County was authorized to continue operating under the Order, provided that the municipality submitted to DEC for review and approval a Proposed Subsurface Investigation Plan ("PSIP"), followed by a Subsurface Investigation Report ("SIR"). Based upon the SIRs for the various landfills, DEC was then to determine whether each landfill could meet the standards of Part 360, in which case a permit application for continued operation could be submitted, or whether the landfill must be closed due to inability to comply with Part 360 standards. Landfills requiring closure were to be phased out according to a schedule to be determined by DEC. The closure schedule would require those landfills with more serious noncompliance to close first, and allow those with less serious noncompliance to remain open for a transition period while a comprehensive solid waste management plan for the County was developed and implemented. Based upon DEC's review of the SIR's which have been submitted to date, DEC has determined that the landfills operated by the Towns of New Paltz, Ulster and Wawarsing demonstrate less serious noncompliance than others in the County, and may be allowed to operate for a transition period, consistent with the prior Orders and with DEC Enforcement Directive # II.14, dated 9/17/84 and revised 12/29/88, entitled "Closure of Active Municipal Solid Waste Landfills."

VII. Stipulated penalties. (a) In the event that Respondent UCRRA fails to timely comply with any of the requirements established by the paragraphs 1,3 or 4 of the Schedule of Compliance or any of the provisions of paragraphs VI or VIII of this Order, the following stipulated penalties shall be due and payable:

PERIOD OF NONCOMPLIANCE	PENALTY PER DAY
1st day through 30th day	$ 250
31st day through 60th day	$ 500
each day thereafter	$ 1,000

(b) In the event that the Department determines that Respondent UCRRA has violated any provision of this Order, the Department may serve upon the Respondent UCRRA a notice of noncompliance which shall set forth the nature of the violation(s) and the calculation of penalties due. Respondent UCRRA shall deliver the full penalty amount to DEC within 10 business days after receipt of such notice. The assessment of stipulated penalties as set forth above shall not limit the Department's right to seek such other relief as may be authorized by law.

VIII. Failure to make penalty payment. (a) In the event that the Respondent UCRRA fails to pay any penalty due pursuant to this Order by the date due, this Order together with a notice of noncompliance specifying the amount due may be filed and enforced by DEC as a civil judgment for the total penalty amount set forth in the notice of noncompliance without the need for any further proceedings whatsoever.

(b) With regard to any penalty due pursuant to this Order which is not paid by the specified due date, Respondent UCRRA shall be liable for and shall pay interest from the due date at the rate specified by the New York Civil Practice Law and Rules for interest on a judgment.

IX. Environmental Monitor. Respondent UCRRA shall undertake the funding of an Environmental Monitor consistent with the requirements of Part Two of the Schedule of Compliance.

X. Conditional authority to operate. In the event that the Department may determine, in the Department's sole discretion, that the Respondent UCRRA has failed to timely and fully comply with any provision of this Order, the Department may serve upon the Respondent UCRRA a notice of noncompliance setting forth the nature of the violation(s). Upon receipt of such notice, Respondent UCRRA shall immediately cease operation

of the Facility, if the notice so directs, or modify operations in such manner as may be specified in the notice. If the Department subsequently determines that Respondent UCRRA has brought the Facility back into compliance with the terms of this Order, the Department may notify Respondents in writing that operation of the Facility may resume. Respondent UCRRA shall not resume operation of the Facility in the absence of such written notification.

XI. Closure. Respondent UCRRA shall permanently cease all acceptance of waste at the Facility by no later than December 31, 1995. There shall be no modification of this date, except that the Department may in its sole discretion order the Facility to close at an earlier date in the event that the Department finds that any condition at the site may present an imminent danger to the health or welfare of the people of the State, or results in or may be likely to result in irreversible or irreparable damage to natural resources, or that Respondent UCRRA is failing to operate and maintain the landfill in compliance with applicable standards of Part 360 or of this Order. The Department shall provide written notice to Respondents of its determination and shall allow Respondent UCRRA no more than thirty (30) calendar days after receipt of such notice to either: (1) take corrective action to eliminate the threat of harm or its noncompliance in the Department's sole discretion, based upon its determination of the extent of the threat or noncompliance and its timely correctability, or (2) to cease acceptance of solid waste and close the landfill in accordance with this Order, the approved closure plan and 6 NYCRR Part 360.

XII. Closure fund. Respondent UCRRA shall, within thirty (30) days of the effective date of this Order, establish an interest-bearing account, in a financial institution authorized to do business in New York, in which account shall be deposited revenues from tipping fees collected as a result of disposal activity conducted pursuant to this Order, in an amount sufficient to pay the costs of operating, closing and monitoring the consolidation landfills. In the event that DEC determines that the amounts deposited in the account may not be sufficient for the stated purposes, DEC may require that additional amounts be deposited to provide sufficient funding. Respondent UCRRA shall submit a plan for DEC approval demonstrating that revenues collected shall be adequate to pay the costs of operating, closing and monitoring the consolidation landfills.

XIII. Certified Landfill Operator. Respondent UCRRA shall continue to ensure that the landfill is operated, on a daily basis, by a landfill operator certified by the Department pursuant to 6 NYCRR Part 360.

XIV. Other remedies: (a) Nothing contained in this Order shall be construed as barring, diminishing, adjudicating or in any way affecting (1) any legal, administrative or equitable rights or claims, actions, suits, causes of action or demands whatsoever that the Department may have against anyone other than Respondent; (2) the Department's right to enforce, administratively or at law or in equity, the terms, provisions and conditions of this Order against Respondent UCRRA, its directors, officers, employees, servants, agents, successors and assigns in the event that Respondent UCRRA shall be in material breach of the provisions hereof; (3) the Department's right to bring any action, administratively or at law or in equity against Respondent UCRRA, its directors, officers, employees, servants, agents, successors and assigns which the Department could otherwise maintain with respect to areas or resources that may have been affected or contaminated as a result of the release or migration of wastes from the site or from areas in the vicinity of the site; (4) the Department's right to commence any action or proceeding relating to or arising out of any disposal of hazardous wastes at the site, as those wastes are defined by applicable regulation; or (5) the Respondent UCRRA's right to challenge any such action by the Department, whether by administrative hearing or otherwise, to the extent otherwise permitted by law.

(b) This Order shall not be construed to prohibit the Commissioner or his duly authorized representative from exercising any summary abatement powers, either at common law or as granted pursuant to statute or regulation.

XV. Submissions. All reports and submissions herein required shall be made to the Region 3 headquarters, New York State Department of Environmental Conservation, 21 South Putt Corners Road, New Paltz, New York 12561, attention: Richard Gardineer, Regional Solid and Hazardous Waste Engineer. Respondent UCRRA shall be responsible for the content of any submissions made pursuant to this Order. Submission of any material containing assertions of fact shall be considered an affirmative representation by Respondent UCRRA of the truth of such assertions.

XVI. Review of submissions. After the Department's receipt of any submission required pursuant to this Order, the Department shall notify Respondents, in writing, of its approval or disapproval of the submission. If the Department approves the submission, Respondent UCRRA shall implement it in accordance with its schedule and terms, as approved. If the Department disapproves the submission, the Department shall provide to Respondents written notice of its disapproval, specifying with reasonable particularity the grounds for

disapproval. Within thirty (30) days after Respondents receive written notice of disapproval, Respondent UCRRA shall submit a revised submission which fully responds to each of the Department's specified grounds for disapproval. After the Department's receipt of Respondent UCRRA's revised submission, the Department shall notify Respondent, in writing, of its approval or disapproval. If the Department approves the revised submission, Respondent UCRRA shall implement it in accordance with its schedule and terms, as approved. If the revised submission is not approvable as submitted, the Department, at its option, may disapprove it or may approve it on condition that Respondent UCRRA accept such modifications as may be specified by DEC to make it approvable. If the Respondent UCRRA does not accept such modifications, the revised submission will be disapproved. If the Department disapproves the revised submission, the Respondent UCRRA shall be in violation of this Order. The submission or revised submission, as approved, shall be deemed incorporated into this Order.

XVII. Regional Plan; Cooperation. The parties agree to cooperate in implementing the Solid Waste Management Plan to be undertaken by the Respondent UCRRA.

XVIII. Notice of work. Respondent UCRRA shall provide notice to the Department of any excavating, drilling, sampling or construction activities outside the scope of normal day-to-day waste disposal activities to be conducted pursuant to the terms of this Order at least five (5) working days in advance of such activities.

XIX. Communications among parties. (a) All communications to the Department shall be made to:

New York State Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, New York 12561
ATTN: Richard Gardineer, Regional Solid and Hazardous Waste Engineer

Four (4) copies shall be submitted.

(b) All communications to the Respondents shall be made to:

Town of Ulster
Town Hall
Lake Katrine, NY 12449
ATTN: Frank Sottile, Supervisor

and

Ulster County Resource Recovery Agency
52 Main Street
UPO Box 4298
Kingston, NY 12401
Attn: Charles P. Shaw

and

Ulster County Resource Recovery Agency
c/o Stephen J. Wing, Esq.
Coombs, Kranis & Wing, P.C.
The Vassar-Main Office Building
191 Main Street
P.O. Box 910
Poughkeepsie, NY 12602

(c) The parties reserve the right to designate other addresses on written notice to all other parties.

XX. Inspections. For the purpose of insuring compliance with this Order, and with applicable provisions of the ECL and regulations promulgated thereunder, representatives of this Department shall be permitted access to the facility and to relevant records during reasonable hours, in order to inspect and/or perform such tests as may be deemed appropriate to determine the status of Respondent UCRRA's compliance.

XXI. Filing. Within 30 days after the effective date of this Order, Respondent UCRRA shall file a copy of this Order with the real property records of the Ulster County Clerk's Office, for the purpose of providing notice of this Order to all potential future purchasers of any portion of the facility, and shall within 30 days thereafter provide notice to DEC of such filing. Any successor in title to any portion of the site or facility shall be responsible for implementation of provisions of this Order.

XXII. Split samples. The Department shall have the right to obtain for the purpose of comparative analysis split samples or duplicate samples, at the Department's option, of all substances and materials sampled by Respondent UCRRA pursuant to this Order.

XXIII. Conveyance. In the event that Respondent Town proposes to convey the whole or any part of its ownership interest in the Facility, Respondent Town shall not less than 30 days prior to the consummation of such proposed conveyance, notify the Department in writing of the identity of the

transferee and of the nature and date of the proposed conveyance. In advance of such proposed conveyance, Respondent Town shall notify the transferee in writing, with a copy to the Department, of the applicability of this Order.

XXIV. Other approvals. Respondent UCRRA shall be obligated to obtain whatever permits, easements, rights of entry, approvals or authorizations may be necessary in order to carry out its obligations under this Order. This Order shall not relieve the Respondent UCRRA of the obligation to comply with any other laws, rules or regulations of the State of New York or any other governmental authority which are applicable to Respondent UCRRA's activities, nor preclude or limit such enforcement action as may be authorized by law for any such violation.

XXV. Indemnification. Respondent UCRRA shall indemnify and hold the Department, the State of New York, and their representatives and employees harmless for all claims, suits, actions, damages and costs of every name and description arising out of or resulting from the fulfillment or attempted fulfillment of the provisions hereof by Respondent UCRRA, its directors, officers, employees, servants, agents, successors or assigns.

XXVI. Force majeure. Respondents shall not be in default of compliance with this Order to the extent that Respondents may be unable to comply with any provision of this Order because of the action of a national or local government body (other than Respondents) or court, an act of God, war, strike, riot or catastrophe as to any of which the negligence or willful misconduct on the part of Respondents was not a proximate cause. Respondents shall provide notice to the Department in writing immediately upon obtaining knowledge of such event, and shall request an appropriate modification to this Order. Relief under this clause shall not be available to Respondents, with regard to a particular event, if Respondents fail to provide timely notice of such event. The Respondents shall have the burden of proving entitlement to relief under this clause, by clear and convincing evidence.

XXVII. Modification. (a) If, for any reason, Respondents desire that any provision of this Order be changed, with the exception of Paragraph XI above, Respondents shall make timely written application therefor to the Department setting forth reasonable grounds for the relief sought, together with any supporting documentation tending to establish such grounds. Such request shall be made as soon as reasonably possible after Respondents learn of the grounds for such relief. Where, as

may be determined by DEC, a request for a modification is made in timely fashion and is properly supported and justified in light of all the circumstances, including Respondents' compliance history and the potential environmental consequences of such modification, DEC agrees that such relief will not be unreasonably denied. The granting of a requested modification may be conditioned upon Respondents' acceptance of additional terms, such as payment of penalties and/or suspension, modification or curtailment of operation.

(b) This Order may be modified by the Department pursuant to the criteria and procedures set forth at 6 NYCRR Section 621.13.

(c) No change or modification to this Order shall be made or be effective except as may be specifically set forth in writing by the Department, pursuant to the procedure set forth in subparagraph (a) or (b) above.

XXVIII. Default. The failure of Respondent UCRRA to comply fully and in timely fashion with any provision of this Order shall constitute a default and a failure to perform an obligation under this Order and under the ECL, and shall constitute sufficient grounds for revocation of any permit, license, certification or approval issued to the Respondent UCRRA by the Department.

XXIX. Binding effect. The provisions of this Order shall be deemed to bind the Respondents, their officers, directors, agents, employees, contractors, successors and assigns, and all persons, firms and corporations acting under or for Respondents, including, without limitation, any subsequent operator of the Facility who may carry on activities now conducted by Respondent UCRRA at the Facility, and any successor in title to the Facility or any interest therein.

XXX. Authority. The individual signatories to this Order represent that they have authority to bind the respective parties by execution of this Order.

XXXI. Effective date. The effective date of this Order shall be the date that a fully executed copy of this Order is served upon the Respondents, in person or by mail.

XXXII. Termination. This Order shall terminate upon the conclusion of post-closure monitoring which shall continue for a period of thirty (30) years after all closure activities are satisfactorily completed.

CONSENT BY RESPONDENT

Respondent hereby consents to the issuing and entering of this Order, waives its rights to notice and hearing herein and agrees to be bound by the provisions, terms and conditions contained herein.

_____

BY:

_____

TITLE:

_____

DATE:

_____

STATE OF

ss:

COUNTY OF

On this day of , 199__, before me personally came

to me known, who being by me duly sworn did depose and say that s/he resides in , that s/he is of the Corporation named in and which executed the foregoing instrument, and that s/he executed the foregoing Order on Consent as authorized by said Corporation.

_____

Notary Public

CONSENT BY RESPONDENT

Respondent hereby consents to the issuing and entering of this Order, waives its rights to notice and hearing herein and agrees to be bound by the provisions, terms and conditions contained herein.

_____

BY:

_____

TITLE:

_____

DATE:

_____

STATE OF

ss:

COUNTY OF

On this day of , 199__, before me personally came , to me known, who being by me duly sworn did depose and say that s/he resides in , that s/he is of the Corporation named in and which executed the foregoing instrument, and that s/he executed the foregoing Order on Consent as authorized by said Corporation.

_____

Notary Public

SCHEDULE OF COMPLIANCE

PART ONE

1. Within six months of the effective date of this Order, the Respondent UCRRA shall submit:

(a) A full Operations Plan and Report consistent with 6 NYCRR Part 360-2.5 and Part 360-2.9;

(b) A full Contingency Plan consistent with 6 NYCRR Part 360-1.9(h) and 360-2.10;

(c) A full Closure Plan consistent with 6 NYCRR Part 360-2.15;

(d) An Environmental Monitoring Plan, including ground water, surface water and leachate monitoring, consistent with 6 NYCRR Part 360-2.11(c);

(e) A Landscape Plan consistent with 6 NYCRR Part 360-2.6;

(f) Plans for an interim leachate control system capable of collecting surficial and subsurface leachate consistent with 6 NYCRR Part 360-1.14(b), including a schedule for construction and implementation of the plans.

2. The Respondents shall not place waste of any type outside the waste boundaries that existed at the time of the prior Order dated _____. No waste shall be placed higher than elevation_____. The Respondent UCRRA shall install and maintain a bench mark adjacent to the landfill for the purpose of checking this elevation.

3. Respondent UCRRA shall submit an annual report consistent with 6 NYCRR Part 360-2.17(t).

4. Respondent UCRRA shall undertake activities to site, permit and construct a county landfill consistent with the Ulster County Solid Waste Management Plan and the DEC Enforcement Directive through the following:

a) Respondent UCRRA shall complete a landfill siting study, the first phase of which has been completed as prescribed at 6 NYCRR Part 360-2.12(a)(2)(i). No later than one year after the effective date of this Order, the Respondent UCRRA shall complete subsequent phases of the site evaluation process as prescribed at 6 NYCRR Part 360-2.12(a)(2)(ii) and (iii).

b) Upon completion of the siting study phases in (a) above, respondent UCRRA shall perform subsurface investigations at the three selected candidate sites as required by 6 NYCRR Part 360-2.12(a)(2)(iv). No later than eighteen months after the effective date of this Order, the Respondent UCRRA shall notify the Department in writing of the site selected, and shall submit the results of the subsurface investigations.

c) No later than two years after the effective date of this Order, Respondent UCRRA shall submit (1) a complete Application To Construct a Solid Waste Management Facility at the selected site, including an approvable Draft Environmental Impact Statement; and (2) a contingency solid waste management plan, setting forth how Respondent UCRRA will manage solid waste generated in the County beginning January 1, 1996, in the event that the new County-wide landfill is not completed and permitted by that date.

d) Within nine months of receipt of a Permit To Construct a Solid Waste Management Facility, Respondent UCRRA shall have constructed and certified the first phase of the landfill.

5. By August 6, 1992, the Respondent Town shall submit a report detailing the results of a supplemental subsurface investigation which shall accomplish the following:

a) Re-sampling and analysis of existing monitoring wells SBW4 and DBW2 for volatile organic compounds using analytical methods adequate to ensure detection limits above applicable water quality standards;

b) Installation of a [illegible] wells SBW2 and DBW2 at an appropriate [illegible] measurement of vertical groundwater grad[illegible] well as water quality in the bedrock aquifer at levels whe[illegible] groundwater flows in response to regional hydraulic gradients;

c) Installation and sampling of a new monitoring well screened in the saturated overburden adjacent to existing monitoring wells SBW5 and DBW5.

SCHEDULE OF COMPLIANCE

PART TWO

An interest bearing account to fund the environmental monitor(s) shall be established with the Department as follows:

(a) The sum of $ 89,230 shall be submitted to the Department within ninety (90) days of the effective date of this Order. This sum is based on an estimate of the first year costs and is subject to quarterly revision. Subsequent quarterly payments shall be made until December 31, 1995 to maintain an account balance sufficient to meet the next nine months' anticipated expenses. Quarterly payments shall be made for the duration of this Order in accordance with the following provisions:

(b) Costs to be covered by this fund include:

(1) Direct personal service costs and fringe benefits of the environmental monitor, and a pro-rata portion of the cost of supervision of such monitor by full-time monitor supervisors, including the costs of replacement personnel for the person(s) regularly assigned to these positions.

(2) Direct non-personal service costs, including without being limited to purchase or lease of a vehicle if necessary, which vehicle shall be used solely in connection with the monitoring activities of the Respondent's landfills, and its full operating costs, and any appropriate chemical sampling and analysis, to continue for the duration of this Order.

(3) Inflation increases and negotiated salary increases.

(4) Indirect support or overhead costs at the annual approved indirect support cost rate.

(c) As noted, the Department may revise the required payment on a quarterly basis to include all costs of monitoring to the Department. The quarterly revision may take into account factors such as inflation, salary increases, accrued interest to be applied to the balance, changes in operating hours and procedures and the need for additional on-site monitors and a pro-rata portion of the costs of supervision of such monitors by full-time monitor supervisors.

(d) Within 30 days of written notice by the Department that a payment is due, payment shall be forwarded to the Department. Payment should be sent to the NYS Department of Environmental Conservation, 50 Wolf Road, Room 602, Attention Director of Environmental Monitors, Albany, NY, 12233-1010. Payments are to be in advance of the period in which they will be expended.

(e) Upon termination of this Order and payment of any outstanding costs, the unexpended balance, including interest, will be returned to the Respondent.

(f) The Department may take appropriate action to enforce the payment provisions.

ATTACHMENT E.

ULSTER COUNTY RESOURCE RECOVERY AGENCY

TIPPING FEE PROJECTIONS (1993-1997)

ATTACHMENT E.

DRAFT
5/04/92

ULSTER COUNTY RESOURCE RECOVERY AGENCY
TIPPING FEE PROJECTIONS

PROJECTIONS	1993	1994	1995	1996	1997	DESCRIPTION
EXPENSES:						
Total Agency Administrative Costs:	528	551	576	602	629	Agency administration, billings, consultants
Operating and Maintenance Costs:	3,187	3,374	3,526	4,118	3,835	Landfill, compost, SAC and household hazardous waste operations and maintenance, hauling
Host Community Benefit Fee:	192	206	198	176	167	$1.25/ton for the host communities
Closure & Liner Development Fund:	3,994	4,016	2,980	1,789	1,817	Fund for future capital improvements & consolidation landfill closures
Operating Reserve Fund:	322	360	361	336	333	$2/ton; reserve fund for financial liquidity
Phase II Net Debt Service:	0	1,185	2,212	2,211	2,211	See Bond Sizing Assumptions
Phase III Net Debt Service:	0	0	0	764	1,104	See Bond Sizing Assumptions
Total	8,223	9,692	9,853	9,995	10,096	
REVENUES:						
Service Fee:	7,559	8,449	8,484	7,885	7,814	Difference between total Agency Expenses and non-Service Fee Revenues
Recovered Material Revenues:	567		1,108	1,205	1,307	Current prices and projected volumes for Corrugated Cardboard, Newspaper, Mixed Paper, Ferrous, Glass, Plastic and Aluminum
Commercial Recyc. Tipping Fees:	93	226	243	260	278	$10/ton tipping fee for non-residential use of Agency recycling system
Compost Tipping Fee Revenues:	0	0	0	646	697	Composting of yard waste & sludge; tipping fees -- $0/ton for yard waste; $50/ton for sludge
Total	8,219	8,675	9,835	9,995	10,096	
SERVICE FEE:	7,559	8,449	8,484	7,885	7,814	
WASTE GENERATED:	258,000	262,000	266,000	270,000	274,000	Estimates used in Ulster County Solid Waste Management Plan
WASTE DIVERTED, RECYCLED OR COMPOSTED:	52,805	97,380	107,817	129,324	140,580	Waste Reduction, C&D, HHW, Yard Waste, Sludge & Recyclables
AGENCY WASTE LANDFILLED:	153,896	164,620	158,183	140,676	133,420	Waste generated less waste diverted, composted & recycled less waste directed towards non-Agency landfills
SERVICE FEE ($/TON):	$49 12	$51 33	$53 63	$56 05	$58.57	Service Fee divided by Agency Waste Landfilled

PHASE II BOND SIZING ASSUMPTIONS

SAC Construction/Equipping:	$2,000
Municipal Dropoff Center Upgrades:	800
Consolidation Landfill Upgrades:	1,000
Siting/Permitting New Landfill:	2,500
C&D/ Tire Management:	500
Household Haz. Waste Facility:	500
Closure of Existing Landfills:	6,500
County Reimbursement:	6,200
Total Capital Costs:	$20,000
Net Capitlized Interest:	1,480
Debt Service Reserve Fund:	2,469
Bond Discount & Issuer's Expense:	741
Bond Size:	$24,690

PHASE III BOND SIZING ASSUMPTIONS

Landfill Design & Construction:	$8,740
Landfill Inflation:	1,234
Compost Facility Design & Const.:	0
Total Capital Costs:	$9,974
Net Capitalized Interest:	172
Debt Service Reserve Fund:	1,169
Bond Discount & Issuer's Expense:	350
Bond Size:	$11,665

ATTACHMENT F.

LANDFILL CONSOLIDATION PROGRAM

PUBLIC PARTICIPATION PROCESS

Note: In developing the Landfill Consolidation Plan, the Agency met with and received input from every Ulster County municipality and numerous groups and individuals interested in the County's Solid Waste Management Plan. This attachment contains a list of some of the avenues through which the UCRRA has received public input.

Attachment F.

LANDFILL CONSOLIDATION PROGRAM
PUBLIC PARTICIPATION PROCESS

Municipality/ Organization	Date	Presentation/Workshops/Hearings Negotiations
Denning	3/02/92	Town Board Presentation
Esopus	11/01/91	LF Site Investigation
	1/06/92	Full Board Workshop
	1/23/92	Negotiation Workshop
Gardiner	3/10/92	Town Board Presentation
Hardenburgh	1/28/92	Board Workshop
	3/19/92	Town Board Presentation
Hurley	12/10/91	Workshop
	1/15/92	Workshop
	1/28/92	Town Board Presentation
Kingston (C)	1/21/92	Workshop - Mayor/Aldermen
	2/04/92	Presentation Common Council
	3/24/92	Negotiation Workshop
	4/23/92	Disc.- Public Works Comm.
Kingston (T)	1/22/92	Workshop
	2/26/92	Town Board Presentation
Lloyd	11/08/91	LF Investigation
	1/07/92	Workshop
	1/15/92	Town Board Presentation
Marbletown	2/10/92	Workshop
Marlborough	11/08/91	LF Site Investigation
	1/22/92	Workshop
New Paltz	10/04/91	Mtg. with Town Supervisor
	11/01/91	LF Site Visit
	12/04/91	Mtg. with Town Supervisor
	1/07/92	Workshop
	2/12/92	LF Site Visit w/Town Eng.
	3/31/92	Public Informational Mtg.
	4/08/92	Public Informational Mtg.
	4/29/92	Public Hearing

LANDFILL CONSOLIDATION PROGRAM
PUBLIC PARTICIPATION PROCESS

Municipality/ Organization	Date	Presentation/Workshops/Hearings Negotiations
Olive	1/14/92	Workshop
	2/03/92	Town Board Presentation
Plattekill	1/08/92	Town Board Presentation
	4/09/92	Town Board Presentation
Rochester	11/08/91	LF Site Visit
	1/09/92	Workshop
	1/23/92	Town Board Presentation
Rosendale	2/05/92	Town Board Presentation
Saugerties	10/09/91	LF Site Visit
(incl. Village)	3/18/92	Town Board Presentation
Shandaken	2/03/92	Workshop - Full Board
Shawangunk	2/06/92	Town Board Presentation
Ulster	11/01/91	LF Site Investigation
	12/05/91	Conference Call
	12/20/91	Workshop
	1/10/92	Full Board Workshop
	1/21/92	Town Board Presentation
	2/28/92	Negotiating Session
Wawarsing	11/08/91	LF Site Investigation
(incl. Village)	12/23/91	Workshop
	1/09/92	Full Board Workshop
	1/09/92	Public Info. Meeting
	1/21/92	Negotiation Workshop
	3/30/92	Public Info. Mtg.
	4/30/92	Public Hearing
Woodstock	10/09/91	LF Site Investigation
	12/04/91	Workshop
	2/06/92	Workshop
	2/27/92	Town Board Presentation

LANDFILL CONSOLIDATION PROGRAM
PUBLIC PARTICIPATION PROCESS

Municipality/Organization		Presentation/Workshops/Hearings Negotiations
UCRRA	11/18/91	Workshop - LCP & SW Financing Plan
	12/12/91	Bd. Mtg. - SW Financing Plan
	1/14/92	Workshop - LCP & SWMP Mod.
	1/27/92	Bd. Mtg. - LCP & SWMP Mod.
	2/13/92	Workshop - LCP, SWMP Mod., & Financing Plan
	2/20/92	Bd. Mtg. - SW Financing Plan
	3/17/92	Bd. Mtg. - EAF for LCP & SWMP Modifications
	3/26/92	Workshop - EAF for LCP & SWMP Modifications
	5/04/92	Bd. Mtg. - EAF for LCP & SWMP Modifications
	5/28/92	Public Hearing in LCP & SWMP Modifications

LANDFILL CONSOLIDATION PROGRAM
PUBLIC PARTICIPATION PROCESS

Municipality/ Organization	Date	Presentation/Workshop/Hearings Negotiations
NYSDEC	8/12/91	LF Closure & Consolidation Plan Feasibility discussion
	8/20/91	Establish Consolidation LF Site Screening Criteria
	9/05/91	LF Closure Schedule & SWMP Approval
	10/04/91	LCP; Consent Order & SEQRA Process
	11/13/91	LCP; Consent Order & SEQRA Process
	12/04/91	Consolidation LF Site Selection;
	1/23/92	Landfill Closure Schedule;
	1/28/92	Plan Modification Procedures
	3/20/92	Draft Plan Mod. Submission
UC Legis.	12/19/91	Presentation LCP w/ NYSDEC
	12/30/91	Approval of Service Agree. for Solid Waste Mgmt.
	2/24/92	Report to Community & Env. Affairs Committee
	4/20/92	Report to Community & Env. Affairs Committee
OTHER		
Twn Sup. Assc	2/24/92	LCP & SW Agreement
UC Haulers	3/05/92	LCP, Recyc,& Flow Control
N.P. Rotary	3/12/92	LCP - Presentation
Twn Sup. Assc	4/27/92	LC - Presentation by NYSDEC
League of Women Voters	4/28/92	LCP - Presentation

Attachment G.

RESPONSE TO PUBLIC COMMENT
ON THE MODIFICATIONS TO THE
INTERIM SOLID WASTE MANAGEMENT PROGRAM

COOMBS KRANIS & WING, P.C.
ATTORNEYS AT LAW
THE VASSAR-MAIN OFFICE BUILDING
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*ALSO ADMITTED IN CONN.
**ALSO ADMITTED IN NJ

TEL (914) 471-5000
FAX (914) 471-1470

RESPONSE TO PUBLIC COMMENT ON THE INTERIM SOLID WASTE MANAGEMENT PROGRAM PUBLIC HEARING MAY 28, 1992 WRITTEN COMMENTS FILED BY JUNE 11,1992

1. Comment. The amount of money the Agency intends to collect in Bonds should be reduced. 70% of the Bond proceeds have little to do with Solid Waste Management, and several planned uses for the balance are unjustified.

   Response. All Bond proceeds are related to Solid Waste Management.

2. Comment. The Agency should revise its revenue estimates and financial plan to reflect the actual number of municipalities joining its program.

   Response. Revenue estimates are constantly being revised as the financing plan is better defined. Final revenue projections will be approved and made part of the official statement supporting the Agency's borrowing.

3. Comment. The Landfill Consolidation Plan underestimates the tipping fees and the closing costs of the Plan. These costs have not been reasonably considered. The closing costs should be financed out of tipping fees while the landfills are being used.

   Response. The costs and revenue projections are based upon reasonable expectations. Closing costs will be amortized over a period longer than the operation period.

4. Comment. We should not do the 25 Million Bond financing especially in the financially difficult times. It will bankrupt the County and result in Ulster County having to import New York City's trash.

   Response. The no action alternative would result in higher costs for the communities and no coordinated waste management plan. Ulster will not import solid waste from anywhere.

5. Comment. The Ulster County Legislature subcontracted the People's "power of taxation" to the Agency with a blank mega-check for an unspecified amount of Bonding.

Response. The Legislature placed a $40 million limit on the Agency's authority to issue bonds.

6. Comment. Landfill Consolidation Assistance Program is detrimental to municipalities. Municipalities are better qualified to close their own landfills. Public money should not be offered to close privately owned non-operating landfills. The $500,000 distribution plan is unfair.

Response. The Agency will include in its financial program an allocation of $6.5 million for grants to towns whose landfills are not to be considered as consolidation landfills. The exact formula for allocation of these funds will be worked out jointly between the Agency, the County Legislature and the towns. It is anticipated that the formula will take into consideration the estimated cost of closure, the size of the footprint, and the population effected by the closure. Through the Agency's coordinated closure, the Agency may develop standard specifications for both professional services and closure implementation contracts. The standard contracts are expected to result in substantial savings to the municipalities on both professional services and closure contracts. In addition, the Agency may enter into County-wide contracts for furnishing materials, such as clay cover necessary for closure. County-wide procurement is expected to lower the cost to each municipality. In addition, direct financial reimbursement of closure costs will be provided from funds remaining after the above initiatives. It is projected that the average grant value to each municipality would be approximately $500,000.00.

7. Comment. The Agency's proposal for compensating towns for use of interim landfills is not based on the value of the service provided, and is not in the best interests of the people of the County.

Response. The Agency has based its proposals on the value of service.

8. Comment. The Plan invades Town home rule legally established under the modified DEC permits under which the 15 landfills now properly and legally operate.

Response. The modifications to the Solid Waste Management Plan are being reviewed according to DEC Rules and Regulations and the State Environmental Quality Review Act. The towns are

choosing to participate and negotiate agreements with the Agency. Also, the DEC, the Agency and towns are negotiating the modified orders on consent.

9. Comment. The flow control laws will be found unconstitutional.

Response. The Public Authorities Law creating the Agency and Local Laws No. 8 and 9 of 1991 are and will be held to be constitutional.

10. Comment. Changes in the IMA agreements have not been adequately explored or the impacts discussed.

Response. Numerous public meetings, presentations, workshops, hearings and negotiating sessions have been held on the service agreements with the municipalities. See attachment F of Exhibit 1 to the Environmental Assessment Form.

11. Comment. The health and safety factors of increasing the volume of solid waste disposed in the Town of Ulster landfill should be received.

Response. Plan modifications will not have an adverse environmental impact. Economically, the 15 municipalities will benefit from the plan modifications. UCRRA's immediate involvement in solid waste management will allow for coordinated, orderly closure of existing municipal landfills by providing ongoing disposal capacity at the consolidation landfills. UCRRA will agree, under the solid waste management agreements, the solid waste from all of the municipalities will have a home during the interim period. Thus, no municipality will be required to haul solid waste out of the County as some towns are presently doing (at greater than UCRRA's system). Nor will towns engage in bidding wars with each other over accepting neighboring communities' solid waste. The landfills with the biggest and environmental and siting problems will be closed first. Finally, solid waste will be directed from the municipalities to the most accessible consolidation landfills. Because there are three consolidation landfills, the transportation impact at each site will be kept to a minimum. Only licensed private haulers or the Agency's transfer vehicles will use the consolidation landfills. Finally, all landfills will be closed according to DEC requirements according to DEC's enforcement authority. The three consolidation landfills will be closed according to stringent Part 360 regulations and under DEC enforcement authority. The three consolidation landfills were selected after review of site data and consultation by NYSDEC, Agency and town engineers, which determined that the three landfills would not create adverse environmental impacts.

12. Comment. The short form Environmental Assessment Form incorrectly stated that no adverse environmental effects could result from the action. Major impacts include economic impacts to the 15 towns, transportation impacts and the cost of increased transportation. Also, landfill closure and capping is very likely not environmentally sound, and it leaves the environmental impacts of cleaning up landfill pollution to the next generation.

13. Comment. Section 12C1 of the Environmental Assessment Form misstates the environmental improvement of capping landfills, and entombing the waste degrades our water and air slowly.

Response to Comments 12 and 13. The Environmental Assessment Form does not review the actual method of closure, but covering and monitoring is presently required by NYSDEC regulation. All of the landfills are going to close under NYSDEC consent orders. Under the modified consent orders the landfills should close earlier and under a coordinated system. Transportation impacts are minimized by the use of strategically located Consolidation Landfills.

14. Comment. Landfill Consolidation Plan will have a major change in land use of existing facilities contrary to the Environmental Assessment Form.

Response. All of the 15 existing landfills are operating under orders on consent issued by NYSDEC and accepted by the towns. NYSDEC has indicated that it intends to close all landfills by October of 1993, except for those that operate as consolidation landfills under the Landfill Consolidation Plan. The landfill closure will still go forward, except UCRRA will not organize and coordinate the closures. There is no major charge in use of any existing facility. The increase in use of the Consolidated Landfills will not exceed existing capacities and the balance of the landfills are going to close any way under NYSDEC consent orders.

15. Comment. More public hearings and meetings should be held on the Landfill Consolidation Plan.

Response. Numerous public meetings, presentations, workshops, hearings and negotiating sessions have been held on the Landfill Consolidation Plan. See attachment F of Exhibit 1 to the Environmental Assessment Form.

16. Comment. The Agency has never encouraged public understanding of its Plan; it has operated in secrecy without public trust.

Response. Numerous public meetings, presentations, workshops, hearings and negotiating sessions have been held on the Landfill Consolidation Plan with the general public, County

Legislators, and Town officials.

17. Comment. The Agency is an alienated bureaucracy out of touch with the spirit, nature and people, as well as time, schedules, financial projections and real services.

Response. No response required.

18. Comment. The outcome of the landfill siting search was pre-ordered by a final goal to locate the landfill in Saugerties.

Response. The final goals of the Agency include the location of a county-wide landfill in the County. This effort will be the subject of a site specific environmental review and a 6 NYCRR Part 360 permitting procedure. No site has been selected or pre-ordained.

19. Comment. The host community benefit at $1.25 per ton is not enough to find willing towns. The three landfill consolidations town are getting between $10-$15 per ton. In siting the County landfill, put it out for bid among the communities with the identified candidate areas. If the bidding goes to $20.00 per ton and no town comes forward to accept the site, send it out of the County.

Response. No response required.

20. Comment. The Agency has not focused on and is not interested in conservation, reduction, substitution and reuse, recycling when necessary, remediation, removing toxics from waste, composting, reclaiming landfill space and safe landfilling. If it did focus on these, there would be little waste left to landfill.

Response. The Agency has sought and planned on aggressively reducing, reusing, and recycling the waste stream. The Agency also plans on composting the organic portion of the waste stream and instituting a household hazardous waste program. The Agency studied the possibility of landfill reclamation and concluded that the technology was not available at this time, pending the outcome of analysis of pilot projects.