

**TECHNICAL ASSISTANCE TO  
WATERVILLE/WINSLOW, MAINE  
IN RESOURCE RECOVERY PROCUREMENT  
PLANNING**

**FINAL REPORT**

**Work Assignment No. 8  
Contract No. 68-01-4940**

**Prepared for:**

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Region I  
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**November 19, 1980**

**Gordian Associates Incorporated**

Public Law 94-580 - October 21, 1976

## RESOURCE RECOVERY AND CONSERVATION PANELS

SEC. 2003. The Administrator shall provide teams of personnel, including Federal, State, and local employees or contractors (hereinafter referred to as "Resource Conservation and Recovery Panels") to provide Federal, State and local governments upon request with technical assistance on solid waste management, resource recovery, and resource conservation. Such teams shall include technical, marketing, financial, and institutional specialists, and the services of such teams shall be provided without charge to States or local governments.

This report has been reviewed by the Region I EPA Technical Assistance Project Officer, and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

EPA Region I Project Manager: Susan Santos

## **ACKNOWLEDGEMENTS**

This report has been prepared by Bill Ranney and Dick Richards of Gordian Associates and by Mike McLaughlin and Tom Conrad of SCS Engineers. We would like to acknowledge the valuable assistance provided by the EPA project manager, Susan Santos, Elery Keene and the staff of the North Kennebec Regional Planning Commission, representatives of Keyes Fibre, and the other people who gave their time and energy to this project.

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## I. INTRODUCTION

Anticipating that the landfill would soon reach capacity, the City of Waterville and the Town of Winslow began investigating solid waste disposal alternatives available to them. In 1977, Edward C. Jordan Co., Inc. was retained to evaluate these regional solid waste management alternatives and its recommendation was that energy recovery by means of a starved-air modular combustion system be pursued.

To assist them in the procurement of such a system, Waterville/Winslow contacted U.S. EPA Region I to request assistance under the Technical Assistance Panels Program. After meeting with local elected and appointed affiliates from the Waterville/Winslow area on February 20, 1980, EPA Region I and Gordian jointly determined that continued support through the Panels Program was justified.

A scope of work consisting of the following tasks was developed:

Task 1 - Market Analysis. The contractor shall interview management and staff level personnel associated with the identified market to determine technical and contractual specifications in sufficient detail to support the economic analysis in Task 2. The information will be used by the Waterville/Winslow Corporation (W/W Corp.) in preparing a final contract with the market and for use in any procurement documents.

The contractor shall prepare a sample contract between the W/W Corp. and the market which shall contain all provisions typically found in community-market agreements. The W/W Corp. will be responsible for finalizing and negotiating the contract with the market. The contractor shall advise the W/W Corp. as to the pros and cons of positions taken on key contractual points.

The contractor shall prepare a working paper describing the information prepared and the sample contract.

Task 2 - Economic Analysis. The contractor shall perform a detailed analysis of the costs for a modular combustion unit facility with energy recovery at a size to be decided on by the

W/W Corp. and the maximum amount of energy the market can use. Information from Task 1 shall be used to determine energy revenues. The contractor shall break out all distinguishable costs for capital and operating. The contractor shall state all assumptions made in developing the costs and the reasoning for their use. Financing costs and reserve funds shall also be included in the cost estimate.

The contractor shall prepare a working paper presenting the system costs and the assumptions made.

Task 3 - Develop Strategy for Procurement. The contractor shall analyze institutional issues relevant to the procurement of a resource recovery facility and appropriate for the by-laws and philosophy established by the W/W Corp. The contractor shall evaluate alternative procurement strategies and develop the most appropriate approach based on risk, institutional, and financial issues.

The contractor shall map out the steps in the procurement process and include a cost estimate and schedule for a typical procurement using the above appropriate approach. The cost estimate shall include estimate for engineering, management, legal and financial consultants.

The contractor shall meet with the W/W Corp. to present the results of this and previous tasks. The contractor shall prepare handout materials to be used for discussion purposes.

Task 4 - Final Report. After receiving comments from the W/W Corp., North Kennebec RPC, State of Maine-DEP, and EPA Region I, the contractor shall finalize the working papers from the previous tasks and the presentation of Task 3 into a comprehensive summary report.

It was decided to have Gordian's subcontractor, SCS Engineers, perform Task 1 through its office in Augusta, Maine while the remaining tasks were to be performed by Gordian.

Several of the tasks had to be expanded to address the comments resulting from the presentation of the draft report. The new work focuses on the following issues:

- revision of the steam agreement;
- discussion of the specific risks associated with the project and possible negotiating strategies for the Corporation;
- alteration of the economic-analysis to consider seven day per week operation at the original tonnage level and at a higher tonnage;
- expansion of the sensitivity analysis to cover the potential use of wood chips as a fuel by Keyes Fibre;
- evaluation of potential siting considerations at both Keyes and the Mid Maine Medical Center;
- examination of the Btu content assumptions for the refuse and the potential need for sophisticated air pollution control equipment.
- discussion of the viability of the Mid Maine Medical Center as an alternative energy market.

With the exception of the last task, these issues are addressed in this report.

A preliminary investigation of the Thayer Unit of the Medical Center by SCS Engineerings provided conflicting estimates of the steam demand, ranging from 3000 lb/hr to 15,000 lb/hr. It is generally agreed that demand is lower in the summer, which is when refuse generation is at its peak. By most estimates the steam demand would not be sufficient to use all the steam generated by a modular incinerator facility. The Medical Center has promised to provide detailed and accurate information on their energy requirements.

Cogeneration of steam and electricity is a possibility to match steam production and consumption. Electrical power would serve the refuse-steam plant and the excess sold to Mid-Maine as well. However, based upon the relatively small quantity of electricity which would be generated, it is unlikely that even cogeneration would render the Mid-Maine alternative feasible.

A more intensive investigation of the Medical Center is beyond the scope of this study. Based on the available information, every effort should be made to finalize an agreement with Keyes Fibre for the sale of steam. However, if these negotiations drag on, it may be worthwhile to look more closely at the Medical Center or other potential market. It should be stressed that significant delays will force people to find other energy sources and the present markets will disappear.



## II. PRELIMINARY STEAM PURCHASE AGREEMENT

As subcontractor to Gordian Associates, SCS Engineers has developed a preliminary steam purchase agreement which would control the sale of steam by the Waterville-Winslow non-profit corporation to Keyes Fibre Co. The draft contract incorporates information gained through numerous conversations with representatives of Keyes, including one face-to-face meeting held at Keyes in May 1980. Consequently, SCS feels that this agreement accurately reflects the conditions which Keyes will agree to at this preliminary point in time. However, it should be noted that the specific provisions which both parties may insist upon will undoubtedly change somewhat in the course of final negotiations. This document provides a comprehensive framework for opening discussions. In structure and wording, this agreement resembles the steam contract employed in Auburn, Maine, but there are some important differences reflecting the specific situations of the parties involved.

STEAM PURCHASE AGREEMENT

This Agreement is made this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, by and between the Waterville-Winslow Joint Solid Waste Disposal Facility Corporation, a quasi-municipal corporation organized under the laws of Maine (hereinafter referred to as "Corporation") and Keyes Fibre, An Arcata Company (hereinafter referred to as "Keyes")

WITNESSETH

Whereas, the Corporation is in the process of constructing a waste disposal system capable of disposing by incineration typical municipal waste (residential, commercial and industrial), and

Whereas, the system to be constructed will be capable of supplying certain steam energy requirements for Keyes' manufacturing facilities located near, Waterville, Maine; and

Whereas, the Corporation has expressed an interest in selling and Keyes has expressed an interest in purchasing from the Corporation, all steam produced by the refuse-steam plant up to Keyes' steam requirements at its existing and future manufacturing facilities located at College Avenue, Waterville, Maine;

Now therefore, in consideration of the mutual covenants and conditions hereinafter set forth, and intending to be legally bound, Corporation and Keyes agree as follows:

**Section 1. Definitions.** As used in this Agreement:

1.1 **Steam.** The word "steam" shall mean steam energy meeting the quality requirements specified in Paragraph 3.2 of this Agreement.

1.2 **Pound of Steam.** The words "pound of steam" shall mean steam weighing one pound at saturated conditions at a pressure base of 125 psig.

1.3 **Psig.** The term "psig" shall mean pounds per square inch gauge.

1.4 **Refuse-Steam Plant.** The words "refuse-steam plant" shall mean the facilities to be constructed and operated by the City pursuant to Section 2 of this Agreement.

1.5 **Point of Connection.** The words "point of connection" shall mean a single interface between the Corporation's steam piping and condensate return make-up water system and Keyes' steam piping and condensate return system, which interface shall be located at a point on Keyes' property line nearest the energy conversion equipment and shown in Exhibit A attached hereto.

1.6 **Boiler Efficiency.** The words "boiler efficiency" shall mean the percentage of gross BTU input that is realized as useful BTU output;  $E = \text{BTU output} / \text{BTU input}$ .

## Section 2. Site and System Construction

2.1 Location of Plant. The Corporation will locate the refuse-steam plant adjacent to the existing Keyes manufacturing facility in Waterville, Maine as indicated on the plan attached to this Agreement as Exhibit A, and as more particularly bounded and described on Exhibit B to this Agreement (the "site"). Keyes will lease the site to the Corporation in accordance with the terms set forth in Exhibit C attached hereto.

### 2.2 Construction of Plant.

A. The Corporation agrees at its sole cost and expense to purchase, construct, install, operate and maintain buildings, waste disposal equipment, energy conversion equipment and associated facilities necessary to produce steam through incineration of combustible waste, and to deliver such steam to the point of connection.

B. Keyes will receive and transport steam from the point of connection into its manufacturing facility for use by Keyes. Keyes will furnish a steam line and condensate line properly supported and insulated as required for transportation of steam and condensate from the point of connection to Keyes' manufacturing facilities and return. Transmission losses between the steam generation equipment and the point of connection shall be borne by the Corporation; transmission losses between the point of connection and Keyes' plant shall be borne by Keyes. Ownership of the Keyes-furnished steam and condensate lines shall remain

with Keyes even after termination of this Agreement and regardless whether such lines are connected to the Corporation's facilities.

C. The Corporation may enter into contracts or sub-contracts with third parties or with Keyes for the construction and operation of the refuse-steam plant. If contracts or subcontracts are entered into with third parties, Keyes will continue to look to the Corporation for performance of the Corporation's obligations pursuant to this Agreement, and the Corporation will guarantee performance of this Agreement by such contractors or subcontractors.

### 2.3 Measurement of Steam and Condensate.

A. The Corporation agrees to provide and maintain at its expense a recording steam flow meter which makes a continuous record of steam pressure and temperature.

B. Keyes may install, maintain and operate at its own expense such check measuring equipment as it shall desire, provided that such equipment shall be so installed so as not to interfere with the Corporation's measuring equipment. The accuracy of Keyes' check measuring equipment shall be verified by Keyes at reasonable intervals and, if so requested, in the presence of representatives of the Corporation.

C. The accuracy of the Corporation's measuring equipment shall be verified by the Corporation at reasonable intervals, and if so requested, in the presence of representatives of Keyes, but the Corporation shall not be required to verify the accuracy of such equipment more frequently than once in any thirty (30) day period. Keyes may at any time notify the Corporation that Keyes

desires that the Corporation undertake a special test of any measuring equipment. The expense of any such special test, if requested, shall be borne by Keyes if the measuring equipment tested is found to be in error by not more than two percent (2%), either fast or slow. Following such test, previous recordings of such equipment shall be considered accurate in computing deliveries of steam; but such equipment shall be adjusted at once to record accurately. If upon test, any measuring equipment shall be found to be inaccurate by an amount exceeding two percent (2%), either fast or slow, then the expense of such test shall be borne by the Corporation and any previous recordings of such equipment shall be corrected to a zero error for any period which is known definitely; but in case the period is not known or agreed upon, such correction shall be for a period extending over one-half of the time elapsed since the date of last test.

D. In the event a meter is out of service or is known to be registering inaccurately, the volume of steam delivered shall be determined as follows:

(1) by using the registration of any check meter or meters, if installed and accurately registering, or in the absence of such check meters,

(2) by correcting the error if the percentage of error is ascertainable by calibration, tests or mathematical calculation, or, if both Subparagraphs (1) and (2) are inapplicable, then,

(3) by estimating on the basis of deliveries during periods under similar conditions when the meter was registering accurately.

If the meters are located on Keyes' property, Keyes will provide access to the Corporation at any time. Keyes may inspect the steam meter charts and condensate meter charts at any time upon reasonable notice to the Corporation, and will be entitled to have its representative present and observe the steam and/or condensate meter each month at the time the flows are read for billing purposes.

2.4 Due Diligence in Construction of the Plant. The Corporation will complete the purchase, construction, and installation of the refuse-steam plant and place the same in operation with due diligence.

### Section 3. Terms of General Agreement, Purchase and Sale

#### 3.1 Terms of Agreement.

A. Keyes agrees to purchase from the Corporation all steam generated by the Corporation at its refuse-steam plant up to Keyes' maximum low-pressure steam requirements at its Waterville, Maine, manufacturing facility. The steam so generated by the Corporation and delivered to the point of connection will be for the use of Keyes, and, so long as Keyes remains in business at its Waterville, Maine facility, may not be resold by Keyes without the express prior written consent of the Corporation.

B. Subject to the provisions of Sections 7 and 10, the term of this Agreement shall be ten (10) years, commencing on the date of the Corporation's first delivery of steam to Keyes, with an automatic renewal period of ten (10) years upon the terms contained herein.

3.2 Quantity and Quality of Steam. The Corporation will make available to Keyes at the point of connection in accordance with the operating schedule set forth in Paragraph 5.1, at least 11,000 pounds per hour average of low-pressure saturated steam at 125 psig minimum. Subject to the provisions of Section 5.3, delivery shall be, as a minimum, a total of 264,000 pounds of steam within each 24-hour period.

3.3 Keyes Boilers to Supplement Corporation Steam. Keyes will have the right to maintain, replace, enlarge and continuously operate at its plant its own boiler system to produce that portion of Keyes' steam requirements which the Corporation does not produce through the refuse-steam plant, and Keyes shall have no obligation to pay the Corporation for the use of such Keyes-produced steam.

3.4 Excess Steam or Other Energy. In the event that the Corporation acquires the capacity to generate steam in excess of Keyes' maximum low-pressure steam requirements or to generate electricity or other forms of energy at the refuse-steam plant, the Corporation shall have the right to sell such steam, electricity or other forms of energy to third parties.



#### Section 4. Payment Rates and Terms

4.1 Computation of Steam Rates. Steam will be sold by the Corporation to Keyes on the basis of a commodity charge only for each thousand pounds ("M lb") of steam delivered to Keyes. The rate to be paid for such steam by Keyes to the Corporation will be adjusted quarterly. Keyes will provide the Corporation a Statement of Rate Computation which contains the following information, on or before the last working day of January, April, July, and October each year:

(1) average unit price for fuel consumed by Keyes to produce steam of a comparable type and function as that supplied by the Corporation during preceding calendar quarter ending March 31, June 30, September 30 and December 31 (\$/unit).

(2) description and average heating value of fuel consumed by Keyes to produce steam of a comparable type and function as that supplied by the Corporation during preceding calendar quarter (BUTs/unit).

(3) Keyes' boiler efficiency, computed in accordance with American Society of Mechanical Engineers Power Test Code.

(4) Keyes' thermal conversion constant, to equal energy which must be added to Keyes' average 125 psig steam condensate return to produce steam of a comparable type and function as that supplied by the Corporation (BTUs/1,000 lbs steam)

Upon request of the Corporation, Keyes shall substantiate the information provided. The Corporation shall use the most recent Statement for Rate Computation to determine the price to be paid for steam delivered during each billing period. The intent of the parties with respect to rate computation is to reflect Keyes' costs for producing comparable steam, less the value of services rendered by Keyes (such as supplying make-up water and condensate return).

The price to be paid for such steam by Keyes to the Corporation will be computed as follows:

$$R = K \frac{(P \times C)}{(H \times E)}$$

where

R = commodity rate of payment for steam (\$/1,000 lbs steam)

P = average unit price of fuel consumed by Keyes during preceding calendar quarter (\$/unit)

C = thermal conversion constant (BTUs/1,000 lbs steam)

H = average heating value of fuel consumed by Keyes during preceding calendar quarter (BTUs/unit)

E = Keyes' boiler efficiency, computed in accordance with American Society of Mechanical Engineers Power Test Code

K = discount value, computed as follows:

Steam Quantity Delivered Preceding Quarter (M lb)	1st and 2nd yr.	Subsequent years
0 - 45,900	0.900	0.950
more than 45,900	0.882	0.931

4.2 Billing Procedure. Except as provided in Paragraph 5.3 in connection with interruption of service, Keyes agrees to pay the Corporation for a minimum of 91,800,000 pounds of steam each year during the term of this Agreement, or for such lesser amount which the Corporation may deliver in accordance with Paragraph 3.2. The minimum annual charge shall be prorated in the event that initial deliveries and final deliveries occur on dates other than the first and last days of a calendar year, as the number of days of actual deliveries bears to the total number of days in such year. On or before the 15th day of each month following delivery of steam, the Corporation shall bill Keyes for steam delivered to it during the preceding month. Any balance due the Corporation as a result of Keyes' failure to utilize the guaranteed minimum quantities (i.e., 91,800,000 pounds per year before proration) will be billed annually.

4.3 Payment of Bill. All bills will be due from Keyes to the Corporation upon receipt. A service charge of 2 percent (2%) per month may be added to any balance outstanding thirty (30) days after invoice date. The Corporation may discontinue steam service for nonpayment of its bill upon not less than thirty (30) days written notice to Keyes. Suspension under this paragraph shall not affect the minimum purchase amount to be paid under Paragraph 4.2 above.

## Section 5. Operation of the Heat Recovery System

5.1 Minimum Weekly Operating Schedule. The Corporation agrees to operate the steam generation system at least five

24-hour periods per week, 51 weeks per year. In addition, the Corporation further agrees to consider, without liability, operating the system for additional periods of time, if suitable combustible waste is available to the Corporation and Keyes has a need for the steam produced.

5.2 Water Supply and Treatment. Keyes agrees to supply at its expense all make-up water which may be required by the refuse-steam plant in addition to condensate return for boiler use. All boiler feed water will be properly deaerated and chemically treated so as to provide a non-corrosive, non-scaling steam.

5.3 Notice Requirements for Steam Service Interruption. The Corporation will make reasonable effort to give Keyes notice by the quickest means possible of any unplanned interruption of the steam supply and to give reasonable advance notice of all planned interruptions of the steam supply. The Corporation will make reasonable efforts to coordinate any planned interruption of steam supply with Keyes so as to enable Keyes to take appropriate protective measures. In the event of any such interruption of service resulting in supply of steam by the Corporation of the quality and quantity specified in Paragraph 3.2 on less than 255 days per year, the annual minimum payment required of Keyes under Paragraph 4.2 will be reduced by a fraction, the numerator of which shall be 255 less the actual number of operating days on which steam of the quality and quantity specified in Paragraph 3.2 is supplied, and the denominator of which shall be 255. No liability shall attach to the Corporation or its agents, servants, delegates, or other representatives for failure to deliver steam.

**5.4 Steam Plant Inspection.** In the event that Keyes desires to obtain additional business interruption insurance for its manufacturing facilities, the Corporation agrees, upon reasonable notice from Keyes, to permit an initial inspection of its refuse-steam plant by representatives of the insurance company. The Corporation will not be liable to undertake any action which may be recommended as a consequence of said insurance company's inspection.

**5.5 Steam Plant Operation and Maintenance.** The Corporation will operate or cause to be operated the refuse-steam plant in a manner consistent with good plant management practice. Without limiting the generality of the foregoing, the Corporation will:

A. Provide preventative maintenance, institute proper operating procedures, make all required repairs and replacements, and take other precautions to prevent interruptions and provide reliability of the steam supply.

B. Operate the refuse-steam plant in compliance with all applicable local, state and Federal laws and regulations, and regularly remove and dispose of ash and any other waste products in accordance with all such laws and regulations.

C. Store solid waste materials in a properly designed silo, building or pit while awaiting incineration.

D. Maintain the buildings and land site consistently with good industrially zoned real property management practice, which shall include landscaping the site to make it attractive and compatible with Keyes' property as a well-maintained industrial property.

**5.6 Responsibility.** Nothing herein contained shall create or imply a relationship of principal and agent, or employer and employee, or any relationship other than independent seller and purchaser, as between the parties. Responsibility for complying with all regulatory and permit requirements of the refuse-steam operation shall be solely that of the Corporation.

**Section 6. Termination**

**6.1 Termination with Cause.** Keyes may terminate this Agreement without any further liability under this Agreement:

A. by giving written notice to the Corporation on or before \_\_\_\_\_, in the event that the refuse-steam plant is not constructed; or

B. by giving written notice to the Corporation on or before \_\_\_\_\_, in the event that by \_\_\_\_\_, the refuse-steam plant has not generated steam meeting the quantity and quality requirements of Paragraph 3.2 for at least five (5) consecutive business days.

**6.2 Termination without Cause.** Keyes may unilaterally terminate this Agreement upon not less than ninety (90) calendar days' prior written notice to the Corporation. In the event of such termination, Keyes liability shall be as follows:

(1) For the balance of the term of this Agreement, or any renewal thereof, Keyes shall compensate the Corporation for 91,800,000 pounds of steam per year, with price based

upon the latest commodity rate billed to Keyes by the Corporation before termination. In the event Keyes terminates without cause prior to the first bill having been issued by the Corporation, the commodity rate shall be \$3/1,000 lbs. The price under this paragraph shall increase by 8 percent (8%) per year for the balance of the term of this Agreement, or any renewal thereof.

(2) In the event that at any time following termination of this Agreement, the Corporation commences the delivery or distribution from the refuse-steam plant of steam aggregating 15,000 lbs or more per hour to one or more recipients, then Keyes' liability under this Paragraph 6.2 shall unconditionally terminate.

#### Section 7. Amendments to Agreement

This Agreement and its Exhibits supersede all prior negotiations and oral understandings, if any, and may not be amended or supplemented except in writing signed by both parties.

#### Section 8. Notices

Notices required under Paragraph 5.3 will be given to and by the respective local operating personnel of the Corporation and Keyes. Notices other than those required under Paragraph 5.3 will

be deemed properly given when in writing sent by certified mail,  
postage prepaid and addressed:

if to Corporation

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

if to Keyes

Keyes Fibre

Manager, Manufacturing Eastern Division

College Avenue

Waterville, Maine 04901;

or to such other person as the respective parties may from time to  
time designate in a written notice to the other.

Section 9. Renewal

Upon the expiration of the initial ten (10) year term, this Agreement shall be automatically renewed upon the terms contained herein unless either party gives notice as provided below. The term of said renewal shall be ten (10) years. If either party wishes to renegotiate the Agreement terms, or if either party wishes to terminate this Agreement without a renewal, then the party shall give notice of its desire to renegotiate or terminate to the other party at least one (1) year prior to the expiration of the initial ten (10) year term. Upon receipt of such notice, the parties will negotiate in good faith to reach agreement on the terms and conditions of the renewal agreement, if any.



## Section 10. Force Majeure

10.1 Liability. Except as otherwise provided in this Agreement, neither party nor its agents and employees shall be liable in damages to the other party for any act, omission or circumstance occasioned by or in consequence of any acts of God, strikes, lockouts, acts of the public enemy, wars, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, storms, floods, washouts, arrests and restraints of rulers and peoples, civil disturbances, explosions, breakage or accident to machinery or lines of pipe, the binding order of any court or governmental authority which has been resisted in good faith by all reasonable legal means, and any other similar cause not reasonably within the control of the party claiming suspension and which by the exercise of due diligence such party is unable to prevent or overcome.

10.2 Suspension of Obligations. All obligations pursuant to this Agreement (other than the obligation to pay sums then accrued, due and payable) of the party claiming suspension pursuant to Paragraph 10.1 shall be suspended until the cause for such suspension has been removed, and both Keyes and the Corporation agree to use due diligence to remove or overcome the cause for such suspension.

### Section 11. Interpretation

The paragraph captions are for convenience only and shall not affect the interpretation of this Agreement. This Agreement shall be construed and enforced in accordance with the laws of the State of Maine.

### Section 12. Assignment

This Agreement may not be assigned by either party without the prior written consent of the other party; provided, however, that Arcata may, without the consent of the Corporation, consolidate with or merge into another corporation or permit one or more other corporations to consolidate with or merge into it, or transfer all or substantially all its assets to another corporation and thereafter dissolve, or sell or transfer the Waterville, Maine facilities to another corporation, and may, in connection with any such consolidation, merger, sale or transfer assign this Agreement to the surviving, resulting or transferee corporation without the consent of the Corporation, but only on the following conditions:

- A. that such surviving, successor or transferee corporation is a corporation organized and existing under the laws of the State of Maine or is duly qualified to do business in that State;
- B. that in connection with any such merger or consolidation in which Arcata is not the corporation resulting from or surviving

such merger, the corporation resulting from or surviving such merger shall (i) expressly assume and agree to perform all of Keyes' obligations under this Agreement and (ii) shall file with the Corporation a letter by a firm of nationally known certified public accountants stating that after consummation of such consolidation or merger the corporation resulting from or surviving such merge will have an excess of consolidated assets over consolidated liabilities of at least \$20,000,000; and

C. that in connection with any such sale or transfer, the corporation to which such transfer is made shall (i) expressly assume and agree to perform all Keyes' obligations under this Agreement and (ii) shall file with the Corporation a letter by a firm of nationally known certified public accountants stating that after consummation of such transfer the corporation to which such transfer is made has an excess of consolidated assets over consolidated liabilities of at least \$20,000,000.

### Section 13. Authority

13.1 Corporation's Authority. The Corporation represents and warrants to Keyes that this Agreement and the transactions contemplated by this Agreement have been duly authorized by the Board of Directors of the Corporation and that no further action or authorization is necessary to make this Agreement a binding commitment of the Corporation.

13.2 Keyes' Authority. Keyes represents and warrants to the Corporation that this Agreement and the transactions contemplated by this Agreement have been duly authorized by the Board of Director of the Arcata Company, Inc. and that no further action or authorization is necessary to make this Agreement a binding commitment of Keyes.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be signed and sealed by their duly authorized officers on the date first written above.

WITNESS:

WATERVILLE-WINSLOW JOINT SOLID  
WASTE DISPOSAL FACILITY CORPORATION:

\_\_\_\_\_ By \_\_\_\_\_ (seal)

Name and title: \_\_\_\_\_

WITNESS:

ARCATA COMPANY

\_\_\_\_\_ By \_\_\_\_\_ (seal)

Name and title: \_\_\_\_\_

### **EXHIBITS**

**Exhibit "A" - a preliminary master plan of the refuse-steam facility, including potential expansion**

**Exhibit "B" - a metes and bounds description of the ground lease site, including the right of way beneath railroad tracks**

**Exhibit "C" - a ground lease for the site, containing provisions typical of ground leases**

- 1) 20 year term**
- 2) nominal rent**
- 3) payment of taxes**
- 4) ownership of fixtures**
- 5) approval of improvements**
- 6) reference to and approval of master plan**
- 7) reference to metes and bounds description**
- 8) right of way**
- 9) utility easements**

### III. RISKS AND STRATEGIES

A number of comments were received concerning the Steam Purchase Agreement as originally proposed. Most have been incorporated in the final version appearing in Section II. This section discusses specific risks associated with alternative positions on key contractual provisions, as well as negotiating strategies for each. Finally, a discussion of comments not incorporated is provided.

#### THE PRICING FORMULA

Most of the comments received on the draft Steam Purchase Agreement dealt with the proposed pricing mechanism. Basically, the formula involves computing Keyes actual cost for the generation of its own steam, and applying a discount factor for steam purchased from the Corporation. Discount factors vary depending upon the quantity of steam consumed by Keyes (a 2 percent (2%) volume discount is given for an average consumption of more than 30,000 lbs/hour) and the age of the refuse-steam plant. A larger discount is given Keyes during the first and second years of the Agreement to defray Keyes' expense incurred to install steam supply/condensate return piping to the point of connection. All of the figures used in Paragraph 4.1 of the Agreement are arbitrary, and are shown for illustration purposes only.

The principal advantage of the pricing mechanism is its simplicity. In relatively straightforward fashion, the formula provides a realistic measure of steam value under changing conditions. As a profit-making corporation, Keyes is free to select the most economical fuel alternative for use in its boilers. The price for refuse-steam will always be lower than Keyes actual cost to generate its own steam. From the Waterville-Winslow stand-

point, adjusting the formula on a quarterly basis based upon current energy cost will help assure that refuse-steam plant income does not decrease in real terms.

The risks inherent in this approach are of net benefit to Waterville-Winslow. Looking over the mid-term future (10-20 years) it is unlikely that energy costs for manufacturers such as Keyes will be reduced significantly. Although the formula shown puts the risks of lowered energy costs on Waterville-Winslow, the risk is comparatively remote.

Some hard thinking will be necessary to determine the precise discount factors to be used in the pricing formula. Keyes only true saving will be in terms of fuel used; overhead, labor and administrative expenses will be unaffected by a refuse-steam meeting a small part of its steam requirements. Keyes savings in fuel costs (and perhaps boiler equipment depreciation) must be balanced against those services Keyes will provide the refuse-steam plant, including supply of make-up and boiler feedwater, nominal ground lease rent, and the supply/condensate return lines.

Before suggesting a strategy for negotiating discount factors, it would be helpful to review the price formula again:

$$R = K \frac{(P \times C)}{(H \times E)}$$

where

R = commodity rate of payment for steam (\$/1,000 lbs steam)

P = average unit price of fuel consumed by Keyes during preceding calendar quarter (\$/unit)

**C = thermal conversion constant (BTUs/1,000 lbs steam)**

**H = average heating value of fuel consumed by Keyes  
during preceding calendar quarter (BTUs/unit)**

**E = Keyes' boiler efficiency (dimensionless)**

**K = discount factor (dimensionless)**

For example, if during the preceding quarter Keyes used fuel oil to generate its low pressure steam, the computation might look like this:

- average unit price = \$26 per barrel
- average heating value: 9.2 million BTU/barrel
- boiler efficiency = 82 percent (82%)
- thermal conversion constant assumes steam of 1,193,000 BTU/1,000 lbs and condensate return of 289,000 BTU/1,000 lbs):

904,000 BTU/1,000 lbs.

Substituting,

$$R = K \frac{(26 \times 904,000)}{(9,200,000 \times 0.82)}$$

$$R = K (\$3.11)$$

If K, the discount factor, were 0.90, Keyes would pay Waterville-Winslow \$2.80 per 1,000 lbs steam.

The first step in the negotiation process should be to estimate the value of the services rendered to Waterville-Winslow by



Keyes. These services include (1) nominal ground rent, (2) boiler make-up water, and (3) some length of steam supply and condensate return lines. After these numbers have been estimated, the magnitude of reduced maintenance and capital depreciation to Keyes should be estimated.

Keyes' inclination will naturally be to overstate the value of the ground lease, make-up water, and steam/condensate lines. Waterville-Winslow's goal should be to equate ground lease and make-up water with reduced maintenance and reduce capital depreciation. A nominal discount (say 5 percent (5%)) should therefore be sufficient to serve as Keyes' incentive. The final question would then be to determine any additional discount required to make the steam/condensate lines economically viable for Keyes. If necessary, Waterville-Winslow might even suggest its willingness to install the steam/condensate lines at its expense (with a corresponding decrease in the discount given Keyes).

A major financial consideration is the guaranteed minimum quantity of steam to be purchased by Keyes under Paragraph 4.2. The figure given (91,800,000 lbs steam/year) assumes the minimum operating schedule of Paragraph 5.1 (24 hours day, 5 days/week, 51 weeks/year) and a steam quantity of 15,000 lbs/hour at 125 psig. Keyes will pay for at least this minimum quantity, as adjusted by interruptions in service (Paragraph 5.3). The minimum given compares with the 94,248,000 lbs steam/year which would be delivered assuming a 24 hours/day, 7 days/week, 51 weeks/year and steam quantity of 11,000 lbs/hour at 125 psig. A guaranteed minimum quantity of steam to be purchased assures some stability of revenue over the term of the Agreement. A disadvantage to the minimum quantity language proposed is that an early termination by Keyes could result in a long-term, low cash price of the steam to be purchased. Language adding an 8 percent (8%) per year escalation has therefore been included.

Other financial considerations shown by the sample Agreement include the actual billing mechanism and service charge for late payment. The language used is typical, but need not take precisely this form for the Steam Purchase Agreement.

### THE CONTRACT TERM

A long-term commitment on the part of the purchaser to buy refuse-steam is an acknowledged requirement of every Steam Purchase Agreement. The difficulty in the present case is what constitutes "long-term". Keyes has expressed resistance to any contract term longer than 10 years, with a 10 year renewal. Economic viability of the project probably requires a 15-20 year term. The sample contract establishes a 10 year initial term.

As several commenters noted, amortization of Waterville-Winslow's capital investment over a 10-year term will be difficult. In fact, a 10-year term may present an insurmountable obstacle to construction of the refuse-steam plant. Keyes should be advised of this fact at an early point in negotiations with two goals in mind. First, Keyes may agree to lengthen the contract term. More likely, however, is that Keyes will concede somewhat in negotiating other contract terms (for example the pricing discount factors) because Waterville-Winslow has "given up the store" on the critical question of contract length.

As previously noted, amortizing the refuse-steam equipment over a 10 year period will be difficult. If Keyes is not willing to lengthen the term, perhaps it can otherwise assume some of this capital burden. Keyes may, of course, be making capital improvements in contemplation of receiving refuse-steam (e.g. steam supply and condensate return lines). Keyes expressed tentative disapproval of assuming a greater capital investment role in the project directly, but there may be other alternatives. One such al-

ternative would be for Keyes to purchase revenue or general obligation bonds used to finance the refuse-steam plant. Other arrangements, such as limited suretyship, should be explored with Keyes to determine their acceptability.

Given that the sample contract has only a 10-year basic term, there is nevertheless language included which provides for simple renewal for a similar 10 year period. The renewal is not certain, however. The renegotiation provisions can work to the benefit of either party; the refuse-steam will probably change in value to Keyes or to Waterville-Winslow or both after 10 years of operation. The renegotiation feature makes it likely that the Agreement terms will be adjusted accordingly.

A 20 year ground lease term has been suggested for Exhibit "C". Such a provision would permit Waterville-Winslow to continue to incinerate solid waste for that period and seek other potential markets.

Grounds for termination are clearly set out in Paragraph 6.1. Keyes may terminate without liability should the refuse-steam fail to achieve satisfactory operation on or before a date certain. Keyes may unilaterally terminate the Agreement upon 90 days notice, but will remain liable for the guaranteed minimum quantity of steam as required under Paragraph 4.2 and 6.2. Keyes liability would end upon resumption of steam delivery to a third party.

A question related to that of termination is a successor-in-interest to Keyes Fibre or Arcata Company. Waterville-Winslow's concern in this regard is that Keyes' obligations under the Agreement are assumed. The sample contract forbids assignment without the permission of Waterville-Winslow, unless assignment is made to a responsible firm which expressly assumes Keyes' obligations under the Agreement.

The Agreement is thought to give Waterville-Winslow sufficient protection from premature termination in all circumstances

except bankruptcy. A bonding provision could be sought to provide even greater protection; the cost to Keyes of procuring such a bond would be reflected in the discount factor used to determine refuse-steam price.

#### OPERATION, STEAM QUALITY AND STEAM QUANTITY

Operations and interruptions to operations are often major points of contention during negotiation of Steam Purchase Agreements. In the present case, Keyes will be unable to reduce labor, overhead or administrative expenses of its own boiler operation because the refuse-steam plant will meet only a small portion of Keyes low pressure steam needs. Since Keyes will maintain full steam generation capability on a full time basis, assurance of a constant steam supply from the refuse-steam plant is not as critical to Keyes as might otherwise be the case.

The Steam Purchase Agreement provides that the refuse-steam plant shall operate at least five 24-hour periods each week, 51 weeks per year. The language used is very flexible, and would allow the system to make up for working day interruptions by operating on weekends. The language would also permit expansion to a 7-day-a-week operating schedule should sufficient combustible waste be available and should Keyes have a need for such additional steam.

No liability would be imposed on Waterville-Winslow for failure to maintain the minimum operating schedule; however, the minimum annual payment by Keyes will be adjusted if steam delivery is made on fewer than 255 days a year.

Interruptions in Keyes' ability to use refuse-steam will not result in an adjustment to the minimum annual payment, unless such interruptions are beyond the control of Keyes. Instead, the

Agreement will stand suspended until the cause of the interruption has been removed.

#### OTHER COMMENTS

Some comments received were not incorporated in the "final" version of the Steam Purchase Agreement. The following discussion is intended to respond to the more significant of the comments not incorporated.

#### Acceptable Waste

Waterville-Winslow should probably not seek to limit the kinds of wastes to be burned at the site. Incineration of some kinds of hazardous wastes may prove to be economically attractive at some future date. In any case, there is no reason to unnecessarily limit combustible waste alternatives; any hazardous wastes disposed would be disposed of in accordance with applicable laws and regulations (Sections 5.5 and 5.6).

#### Pricing Formula

Several suggestions were made as to specific factors which should be included or changed within the formula. The earlier discussion of the pricing formula clarified most of these points; in spite of its apparent complexity, the formula is technically straightforward. Keyes will provide new values for all the variables on a quarterly basis. Unit price and heat content for fuels will depend on the fuels used; boiler efficiency will depend on the fuel used and the capital equipment installed; and the thermal conversion constant will depend on the nature of condensate return and technology utilized. All of these values can change, depending on the steam-generating technology which Keyes elects to in-

stall. It would be inappropriate to establish constant values for any of these.

One commenter suggested including a capital investment factor in the formula. Such a change would be difficult to quantify, because Keyes will not purchase any less capital equipment with the refuse-steam plant than without. Keyes capital investment will reflect the amount necessary to generate 100 percent (100%) of its steam requirements independent of the refuse-steam plant. A factor which could be included is the capital depreciation and maintenance factor, since Keyes will presumably operate its equipment less if the refuse-steam plant meets part of Keyes steam demand. Rather than include this factor in the formula, Waterville-Winslow should seek to equate this factor with the make-up water and nominal rent factors in determining Keyes' discount.

#### Guaranteed Minimum Payment

The Steam Purchase Agreement requires Keyes to purchase a minimum quantity of steam, but is silent as to a minimum price. Technology changes at Keyes could affect annual revenues dramatically, as is shown in the economic analysis section of this report. With this in mind, several commenters suggested including a floor price for steam delivered. Such a floor price should be sought in negotiation, but realistically speaking, there is almost no chance Keyes would accept any floor price high enough to make a difference. The only value in seeking such a floor price is in concessions elsewhere during negotiations.

#### IV. ECONOMIC ANALYSIS

This section presents a brief but detailed discussion of the projected economics involved with building and operating a resource recovery system such as is being considered in Waterville/Winslow. The discussion is presented in four subsections: First, the system frameworks and basic assumptions required for the analysis are set forth; second, the capital costs are shown; third, the operating costs are projected; and finally, several sensitivity analyses are developed. In each of these subsections, material is presented in tabular or graphic form whenever possible in an effort to provide easy reference and to clarify the potentially confusing information.

It is important to bear in mind that this data should still be considered preliminary at this point. The information is detailed and based upon reasonable assumptions. Nevertheless there are certain variables which cannot be determined with complete accuracy until final contracts are signed. Perhaps the most speculative element of a preliminary analysis of this kind is the projected revenues from sale of recovered energy. As noted in the previous section, the proposed steam contract provides for a great deal of uncertainty in that area. Gordian has attempted to present a feel for the range of uncertainty in the sensitivity analyses subsection. The point is that the numbers developed here are as realistic as is possible at this preliminary juncture but that a reasonable margin of variance should still be anticipated when final system bids are received from equipment vendors. If the Corporation proceeds to implement the system within the time frame assumed here, then this economic analysis should provide a reliable tool for decision making.

##### EXPLANATION OF SYSTEMS AND ASSUMPTIONS

The economic discussion presented in this section applies to several variations of the same basic system design. That design is based upon the following assumptions:

- **Technical Process:** Modular incineration (based on Consumat type technology)\* using the following combinations of combustion/boiler units:

OPTION A: 4 units @ 25 TPD  
with 2 boilers  
OPTION B: 3 units @ 25 TPD  
with 3 boilers  
OPTION C: 3 units @ 50 TPD  
with 2 boilers

These units are assumed to operate continuously 24 hours a day, 7 days a week. The seven day/week operating schedule requires that these options contain a certain amount of spare capacity. Systems which operate five days per week can make up for downtime by running on weekends. However, with a continuously operating facility this is not possible. Therefore, these alternative systems are sized to keep one unit in reserve to allow for continued operation during scheduled maintenance as well as during unscheduled downtime. Also, the addition of an extra incinerator increases the reliability of the system and allows the facility the option of accepting additional waste. This would be an especially advantageous arrangement if, in the future, the quantity of refuse from the member communities increases. All systems are assumed to be equipped with baghouse type air pollution control (APC) devices. This is the same technology implemented at the Auburn facility. The use of baghouses will assure compliance with Maine's air pollution regulations.

- **Waste Quantities:** Table 4.1 shows the waste tonnage assumptions that were included in the calculations for each system. These tonnages were derived from the December 1977 E.C. Jordan Study and the Waterville landfill survey conducted in June 1980. More reliance was placed on the

\* The use of Consumat's design is meant to be representative of modular incinerator systems and is not an endorsement of any particular system or manufacturer.



TABLE 4.1

## Waste Processing Data for Alternative Systems

SYSTEM	SYSTEM DESIGN CAPACITY (TPD)	YEARLY SYSTEM DESIGN CAPACITY <sup>1</sup> (TPY)	Y	E	A	R	1980
			Days of Operation	Available Waste (TPD)	Total Waste Per Year	Total Waste Processed/ Year <sup>2</sup>	Residue Disposal <sup>3</sup> Per Year
A	100.8	\$33,113	7 days/wk. operation	63 for 42 weeks 70 fr. summer	23,380	22,211	10,053
B	75.6	24,835	7 days/wk. operation	52 for 42 weeks 59 fr. summer	19,470	18,302	8,489
C	147.6	48,487	7 days/wk. operation	88 for 42 weeks 98 fr. summer	32,730	31,094	14,074

1 - Based on 90% system availability

2 - Accounts for possible system downtime when onsite waste storage is infeasible and for a one-week period when Keyes Fibre has no steam demand.

3 - 40% of the processed waste by weight plus unprocessed waste

latter data since it is so current and was obtained directly through sampling. That survey indicated that during the week of sampling Waterville/Winslow generated 345.6 tons of landfillable waste plus 212 tons of waste that was not landfilled. Since the sampling took place in early June it is difficult to estimate how much of the non-landfillable waste would be generated annually. Gordian reviewed the composition of the non-landfillable waste sample and determined that the processible (i.e. combustible in a modular incinerator) portion of these wastes would amount to approximately 2,360 tons annually with most of this waste accumulated over ten weeks during the summer. This figure, coupled with the 17,113 tons of landfillable waste that the survey projected annually, totals to approximately 19,470 tons per year for Waterville/Winslow alone. As shown in Table 4.1, that quantity was applied to the calculations for System B. System B therefore represents a minimum sized facility with capacity for the wastes from Waterville and Winslow only. System A is sized to include the waste streams from the towns of Clinton-Benton and Fairfield in addition to Waterfield/Winslow. The waste quantities for these communities were taken from the estimates presented in the E.C. Jordan report. However, those quantities have been adjusted downward by 9% to account for reduced amounts of glass caused by the introduction of the "bottle bill." The resulting annual total waste tonnage is 23,380 as shown in Table 4.1. The tonnage estimate shown for System C in Table 4.1 is based on the assumption that additional waste will be available to maintain operation at close to 100 TPD on a seven day/week basis. In view of the approximate nature of these waste estimates and in the absence of reliable population projections, the waste quantities developed here were assumed to be constant throughout the 20 year life span used in the economic analyses.

- **System Operation:** The following assumptions were employed to calculate system operating costs. Since the economics are projected over the life of the systems, various escalation rates were assumed as indicated. Baseline data were developed for 1983 as the initial year of system operation. Whenever possible, costs were based on actual figures quoted by Keyes.

MSW heating value (HHV): 4,500 Btu/lb\*

Incinerator/boiler efficiency: 60%

Steam generation: 5,800 lb steam/ton of MSW

125 PSIG SAT and condensate return of 300°F

In plant energy usage:

Electricity - at 5¢/kwh for 1980 escalated @  
9% annually

25 kwh/ton of waste processed

Air pollution equipment O&M - 10% of initial APC  
capital cost in 1983 escalated at 10%/year

Auxiliary fuel - \$3.75/MMBtu in 1980 escalated  
@ 12%

250,000 Btu/ton processed waste

Rolling stock: \$.99/gal (diesel) in 1980  
escalated at 12%, 0.3 gallons/ton waste input

Maintenance, parts and supplies:

\$1.75/ton processed waste

Residue characteristics:

weight: 40% of incoming plant waste  
(includes water)

water: 35% of total residue weight

Equipment replacement: 1% of base capital  
(for last 15 years)

- \* This figure is based upon national averages of municipal refuse. In the judgment of Gordian Associates it represents a safe and reliable estimate. To arrive at a more exact figure the communities should undertake an analysis of their refuse to determine its actual Btu content.

Insurance: @ 0.5% of base capital

Downtime assumptions: one week for Keyes downtime

Energy prices for revenue calculations -

No. 6 Fuel Oil (high sulfur): \$38/Bbl in 1983  
escalated at 12% year

Wood chips: \$20/ton delivered in 1980

4500 Btu/lb for wood chips

Discount factor: 30%

Other escalation factors:

Labor	- @ 8%
Materials	- @ 10%
Maintenance	- @ 10%
Residue Disposal	- @ 10%

## CAPITAL COSTS

Estimated capital costs for each of the three systems are presented in Table 4.2. These costs are based on a start-construction date of August 1981. The data used was derived from conversations with numerous system vendors and review of cost information for similar existing or planned facilities.

## OPERATING COSTS

Tables 4.3, 4.4, and 4.5 present annual operating budgets for each system for 1983, 1993, and 2003 respectively. The system life span is here considered to be 20 years, although the fact that potential investors might be reluctant to purchase bonds for more than a 15 year period is recognized in the Debt Service line item. Thus, in Table 4.5 (2003) the Debt Service is zero although the Equipment Replacement line item is increased significantly to account for accelerated machinery breakdown. Labor costs are developed from the detailed labor requirements for each system presented in Tables 4.6 through 4.8. The Outside Services line item includes such necessary costs as telephones, periodic vector control, laundry, janitorial, and other miscellaneous professional and upkeep services. Residue Disposal is assumed to be handled by contract rather than by in-house equipment. The baseline costs used for this item are

TABLE 4.2

**CAPITAL COSTS**  
**Potential Modular Incinerator System**  
**Waterville/Winslow**

System	A	B	C
Installed Capacity	4x25TPD 2 Boilers	3x25TPD 3 Boilers	3x50TPD 2 Boilers
1. Land	0	0	0
2. General construction			
(a) Site Preparation	\$ 130,000	\$ 110,000	\$ 150,000
(b) Incinerator Facility	650,000	540,000	840,000
3. Refuse Processing			
(a) Incinerator Modules	2,000,000	1,600,000	2,300,000
(b) Air Pollution Control	360,000	340,000	390,000
(c) Piping (steam and condensate return)	60,000	50,000	60,000
4. Other Equipment			
(a) Weigh Scale	50,000	50,000	50,000
(b) Front-end Loader	20,000	20,000	20,000
(c) Fuel tank	10,000	10,000	10,000
(d) Spare Parts, Tools, etc.	10,000	10,000	10,000
PROJECT SUBTOTAL	\$3,290,000	\$2,730,000	\$3,830,000
5. Relief Factors			
(a) Omissions & Contingency (10%)	329,000	273,000	383,000
(b) Escalate to 8/81 (10%)	329,000	273,000	383,000
PROJECT SUBTOTAL	\$3,948,000	\$3,276,000	\$4,596,000
6. Fees and Construction Costs			
(a) Engineering and Construction Mgmt (10%)	395,000	328,000	460,000
(b) Organization, Mgmt, Legal (5%)	198,000	164,000	230,000
(c) Finance costs and interest during const. (10%)	395,000	328,000	460,000
(d) Start-up Costs (3%)	118,000	98,000	138,000
TOTAL CAPITAL COSTS	\$5,054,000	\$4,194,000	\$5,884,000

TABLE 4.3

**ANNUAL COSTS (1983 DOLLARS)**  
**Modular Incineration System Options**  
**Waterville/Winslow**

<b>System</b>	<b>A</b>	<b>B</b>	<b>C</b>
<b>Installed Capacity</b>	<b>4x25TPD 2 Boilers</b>	<b>3x25TPD 3 Boilers</b>	<b>3x50TPD 2 Boilers</b>
<b>Daily Tonnage Capacity</b>	<b>100.8TPD</b>	<b>75.6TPD</b>	<b>147.6TPD</b>
<hr/>			
1. Debt Service (15 years @ 7%)	\$ 555,000	\$ 460,000	\$ 646,000
2. Labor	451,000	395,000	480,000
3. Air pollution equipment O&M	36,000	34,000	39,000
4. Utilities			
(a) Electricity*	34,000	28,000	47,000
(b) Fuel	37,000	30,000	51,000
(c) Water/sewer	13,000	13,000	13,000
5. Maintenance, parts and supplies	49,000	41,000	69,000
6. Outside Services	15,000	15,000	15,000
7. Equipment Replacement	51,000	42,000	59,000
8. Insurance	27,000	21,000	30,000
9. Disposal of Residue Contract Hauling	31,000	26,000	44,000
	<hr/>	<hr/>	<hr/>
<b>TOTAL COST</b>	<b>\$1,299,000</b>	<b>\$1,105,000</b>	<b>\$1,493,000</b>
<b>Energy Revenues</b>	<b>686,000</b>	<b>566,000</b>	<b>891,000</b>
	<hr/>	<hr/>	<hr/>
<b>Net Cost</b>	<b>\$ 613,000</b>	<b>\$ 539,000</b>	<b>\$ 602,000</b>
<b>Net Cost Per Ton</b>	<b>\$ 27.60</b>	<b>\$ 29.45</b>	<b>\$ 19.36</b>

\* Does not include electricity for APC devices

TABLE 4.4

**ANNUAL COSTS (1993 DOLLARS)**  
**Modular Incinerator System Options**  
**Waterville/Winslow**

System	A	B	C
Installed Capacity	4x25TPD 2 Boilers	3x25TPD 3 Boilers	3x50TPD 2 Boilers
Daily Tonnage Capacity	100.8TPD	75.6TPD	147.6TPD
<hr/>			
1. Debt Service (15 years @ 7%)	\$ 555,000	\$ 460,000	\$ 646,000
2. Labor	974,000	853,000	1,036,000
3. Air pollution equipment O&M	93,000	88,000	101,000
4. Utilities			
(a) Electricity	80,000	66,000	111,000
(b) Fuel	115,000	93,000	158,000
(c) Water/Sewer	34,000	34,000	34,000
5. Maintenance, parts and supplies	127,000	106,000	179,000
6. Outside Services	32,000	32,000	32,000
7. Equipment Replacement	132,000	109,000	153,000
8. Insurance	27,000	21,000	30,000
9. Disposal of Residue Contract Hauling	80,000	67,000	114,000
	<hr/>	<hr/>	<hr/>
TOTAL COST	\$2,249,000	\$1,929,000	\$2,594,000
Energy Revenues	2,131,000	1,758,000	2,767,000
Net Cost	\$ 118,000	\$ 171,000	-\$ 173,000
Net Cost Per Ton	\$ 5.31	\$ 9.34	-\$ 5.56

TABLE 4.5

**ANNUAL COSTS (2003 DOLLARS)**  
**Modular Incinerator System Options**  
**Waterville/Winslow**

<b>System</b>	<b>A</b>	<b>B</b>	<b>C</b>
<b>Installed Capacity</b>	<b>4x25TPD 2 Boilers</b>	<b>3x25TPD 3 Boilers</b>	<b>3x50TPD 2 Boilers</b>
<b>Daily Tonnage Capacity</b>	<b>100.8TPD</b>	<b>75.6TPD</b>	<b>147.6TPD</b>
<hr/>			
1. Debt Service* (15 years @ 7%)	0	0	0
2. Labor	\$2,103,000	\$1,842,000	\$2,237,000
3. Air pollution equipment O&M	241,000	228,000	262,000
4. Utilities			
(a) Electricity	189,000	156,000	263,000
(b) Fuel	357,000	289,000	314,000
(c) Water/Sewer	88,000	88,000	88,000
5. Maintenance, parts and supplies	329,000	275,000	464,000
6. Outside Services	69,000	69,000	69,000
7. Equipment Replacement	555,000	460,000	646,000
8. Insurance	27,000	21,000	30,000
9. Disposal of Residue Contract Hauling	208,000	174,000	296,000
<b>TOTAL COST</b>	<b>\$4,166,000</b>	<b>\$3,602,000</b>	<b>\$4,669,000</b>
<b>Energy Revenues</b>	<b>\$6,619,000</b>	<b>\$5,460,000</b>	<b>\$8,594,000</b>
<b>Net Cost</b>	<b>-\$2,453,000</b>	<b>-\$1,858,000</b>	<b>-\$3,925,000</b>
<b>Net Cost Per Ton</b>	<b>-\$ 110.44</b>	<b>-\$ 101.52</b>	<b>-\$ 126.23</b>

\* Debt is retired after 15 years. For the remainder of the project life equipment replacement costs are increased to assure continuous facility operation.



TABLE 4.6

**LABOR COST ESTIMATES**  
**100 TPD Modular System -- 4 Units**  
**(Candidate System A)**

<u>Job Title</u>	<u>No. of Workers</u>	<u>Pay Rate</u>	<u>Annual Cost</u>
Plant Manager	1	\$25,000/yr	\$ 25,000
Weigh Clerk /Clerical	1	\$5.00/hr	10,400
Shift Foreman	4	\$11.00/hr	91,520
Front-end Loader Operator	5	\$9.00/hr	93,600
Mechanic, Maintenance	1	\$8.00/hr	16,640
Laborer	2	\$7.00/hr	29,120
<b>SUBTOTAL</b>	<b>14</b>		<b>\$266,280</b>
Forced Overtime 10%			26,600
Fringe Benefits 30%			78,900
<b>TOTAL ESTIMATED ANNUAL PAYROLL</b>			<b>\$371,780</b>

TABLE 4.7

LABOR COST ESTIMATES  
75TPD Modular System - 3 Units  
(Candidate System B)

<u>Job Title</u>	<u>No. of Workers</u>	<u>Pay Rate</u>	<u>Annual Cost</u>
Plant Manager	1	\$25,000/yr	\$ 25,000
Weigh Clerk/Clerical	1	\$5.00/hr	10,400
Shift Foreman	4	\$11.00/hr	91,520
Front-end Loader Operator	4	\$9.00/hr	74,880
Mechanic, Maintenance	1	\$8.00/hr	16,640
Laborer	1	\$7.00/hr	14,560
	<hr/>		<hr/>
SUBTOTAL	12		\$233,000
Forced Overtime 10%			23,300
Fringe Benefits @ 30%			69,900
			<hr/>
TOTAL ESTIMATED ANNUAL PAYROLL			<u><u>\$326,200</u></u>

TABLE 4.8

LABOR COST ESTIMATES  
150TPD Modular System - 3 Units  
(Candidate System C)

<u>Job Title</u>	<u>No. of Workers</u>	<u>Pay Rate</u>	<u>Annual Cost</u>
Plant Manager	1	\$25,000/yr	\$25,000
Weigh Clerk/Clerical	1	\$5.00/hr	\$10,400
Shift Foreman	4	\$11.00/hr	\$91,520
Front-end Loader Operator	5	\$9.00/hr	\$93,600
Mechanic, Maintenance	2	\$8.00/hr	\$33,280
Laborer	2	\$7.00/hr	\$29,120
	<hr/>		<hr/>
SUBTOTAL	15		\$282,920
Forced Overtime 10%			28,292
Fringe Benefits 30%			84,876
			<hr/>
TOTAL ESTIMATED ANNUAL PAYROLL			\$396,088
			<hr/>

derived from conversations with the Central Maine Disposal Company which identified a 1980 cost of \$45 per 18 ton truckload. Energy revenues for all systems are based on oil as Keyes' alternative fuel, escalated at 12% and discounted 30%. This yields a 1983 baseline steam price of \$5.33/1,000 lbs. Net cost per ton figures are based on total waste processed (see Table 4.1) for each system.

### SENSITIVITY ANALYSES

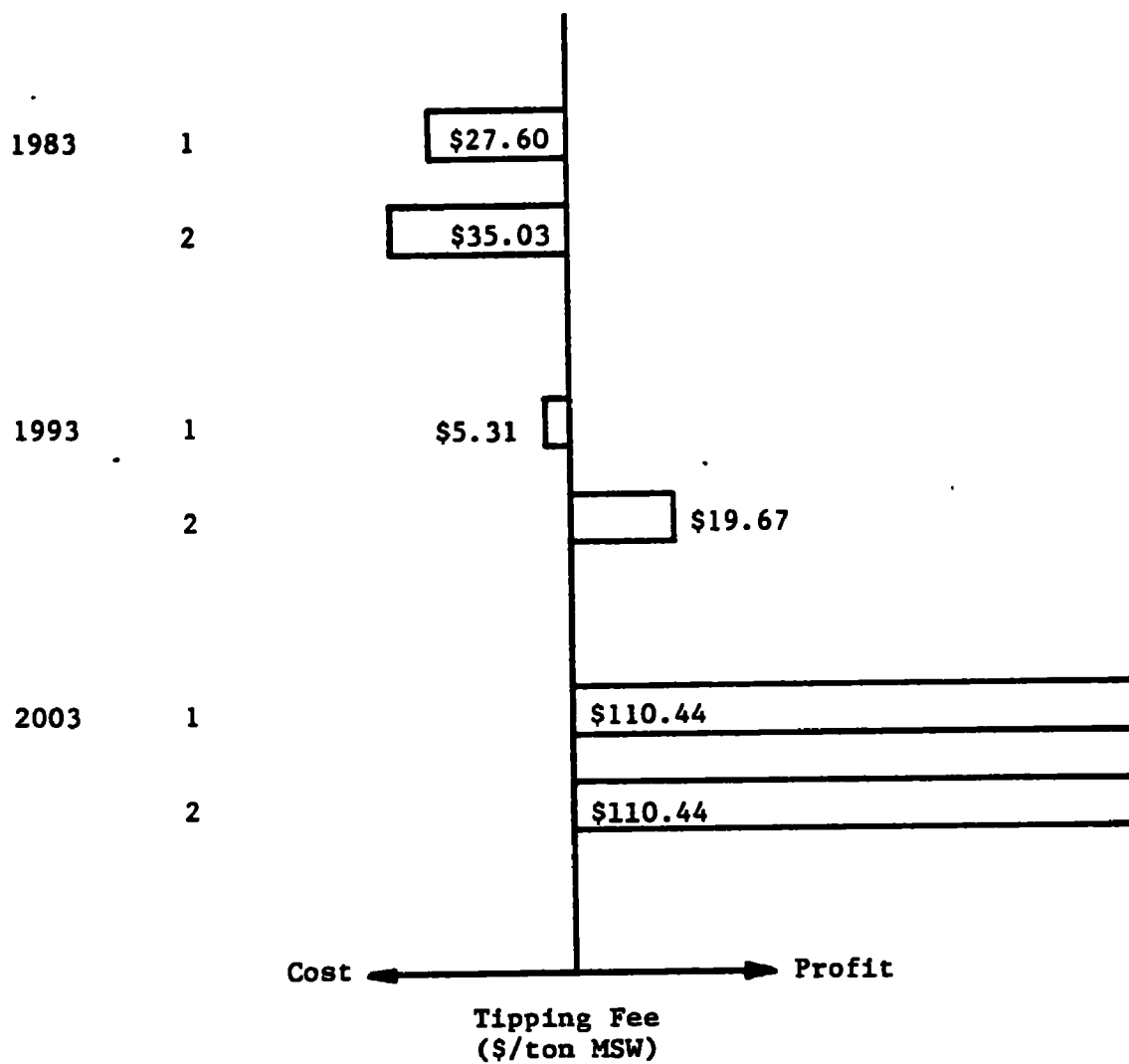
Because of the inherent uncertainty involved with projecting into the future and the relatively large number of unresolved elements related to this project, Gordian has developed a series of curves to show the sensitivity of net system\* costs to changes in several of the more significant variables.

The first analysis, shown in Figure 4.1, develops the effects of varying the length of the bonding period from 10 to 15 years. This variance is important because investors may not be willing to purchase bonds for periods longer than 10 years if the steam purchase agreement with Keyes is only for an initial 10 year commitment. Even if Keyes would agree to commit to a longer than 15 year steam contract it is unlikely that investors would purchase bonds with longer than 15 year paybacks given the relatively unproven track records of modular incinerators. The different bond payback periods would affect the debt service and net system costs as shown in Figure 4.1. Initially, there is approximately a \$7/ton difference between the two scenarios, which jumps to \$24/ton when the 10 year bond is repaid. Between 1993 and 1998 the 10 year bond option is less expensive because there is no debt service. However, after 1998 the debts for both alternatives are paid, so the savings are equal. The advantages of the 10 year debt are that the bond issue may be easier to sell and that between 1993 and 1998 it will produce a greater saving. However, during the early years of the project the 15 year debt option is less expensive. Since the project is likely to experience high front end costs, the 15 year debt service option is probably more attractive.

\* All sensitivity curves in this subsection are based on system option A as described earlier.

FIGURE 4.1

## SENSITIVITY ANALYSIS ON DEBT SERVICE LENGTH



## Key:

- 1 - (baseline case) 15 year debt service with 7% interest rate and given assumptions
- 2 - 10 year debt service with 7% interest rate and given assumptions

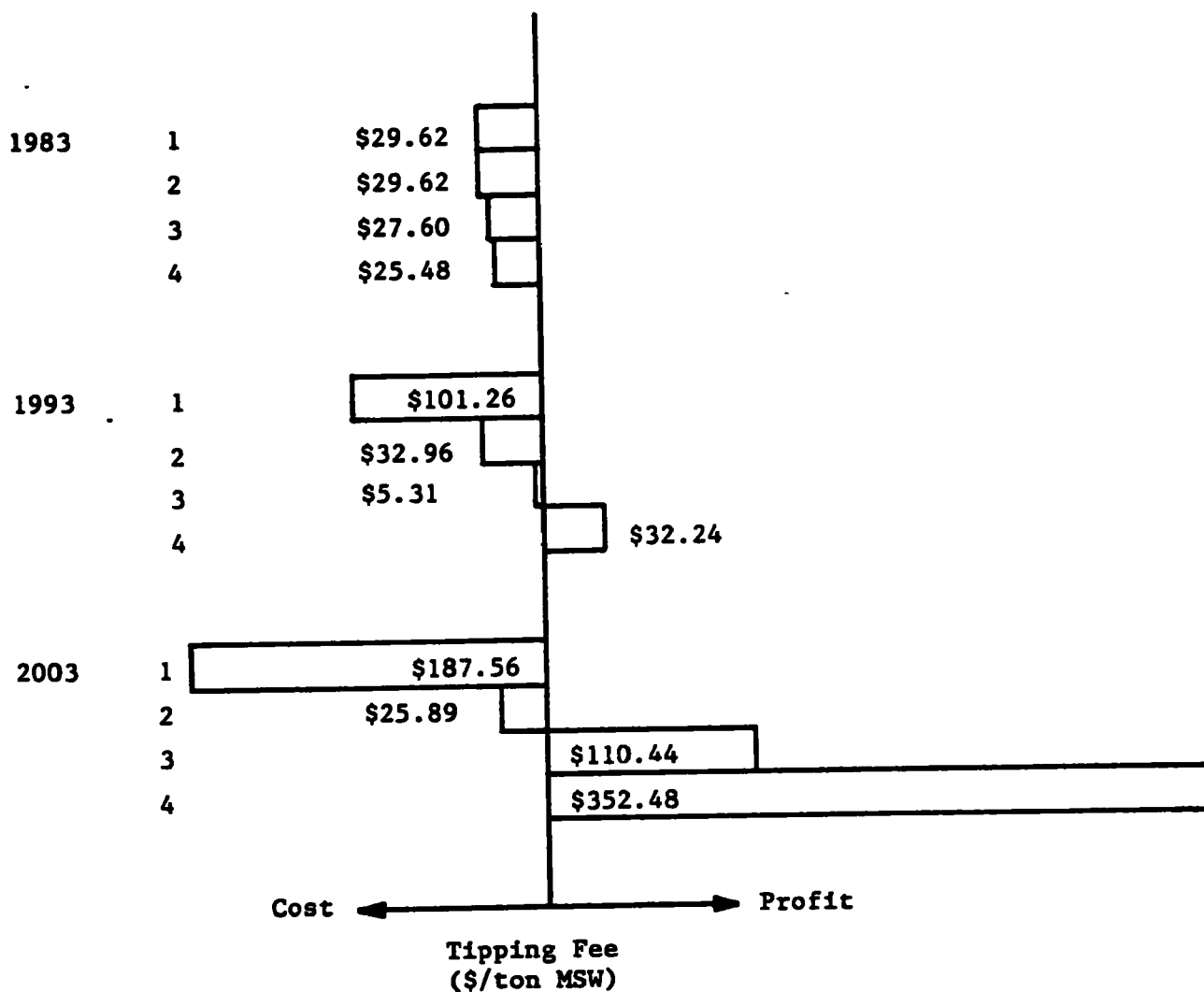
The second sensitivity analysis presented here involves the effect upon steam revenues of varying energy price escalation rates which directly affect net system costs. In Figure 4.2, the net per ton costs of System A over 20 years are compared for energy prices escalated at 9%, 12% and 15%. Recall that a 12% escalation rate was used for the baseline system costs presented earlier. Additionally, the effect of ending revenues completely as a result of Keyes' failing to renew its steam contract is dramatically demonstrated. From this graphic representation, it can be seen that even if energy prices escalate at only 9% the net system costs will decline after ten years. The 12% scenario, which currently looks very reasonable for oil related revenues, begins to realize a profit per ton around 1995. Note that if profits begin to climb too rapidly, Keyes would probably demand some form of revenue sharing or additional steam price discount, so the net profits shown for later years are probably unrealistic. Bear in mind also that the costs/profits shown are not in constant dollars, consequently dollars in the future are worth considerably less than current dollars. Nevertheless, profits and/or lowered costs remain relative.

The final sensitivity curve (Figure 4.3) is similar to Figure 4.2 except that in this scenario, Keyes converts to a wood fired system which considerably reduces steam revenues. As noted earlier, in conversations with Keyes, they expressed a desire to implement a wood fired system as soon as possible. This system would consist of one or two 60,000 lb/hr boilers burning wood chips. The wood chips would be burned as is (roughly 50 - 60% moisture). These boilers operate at efficiencies of 65 - 70%, and the two boiler system would cost \$3,600,000 to \$4,000,000 to install. Gordian assumes that Keyes could not implement such a system prior to 1985, therefore the wood based revenues do not commence until that year. Wood chip prices are currently far below oil prices.

The current price is approximately \$20/ton delivered. The revenues are based on a 30% discount of this price. While it would be attractive for the Corporation to receive credit for a portion of Keyes' capital investment, Keyes is unlikely to agree to this, as discussed in Section 3.

FIGURE 4.2

## SENSITIVITY ANALYSIS ON OIL BASED ENERGY REVENUES

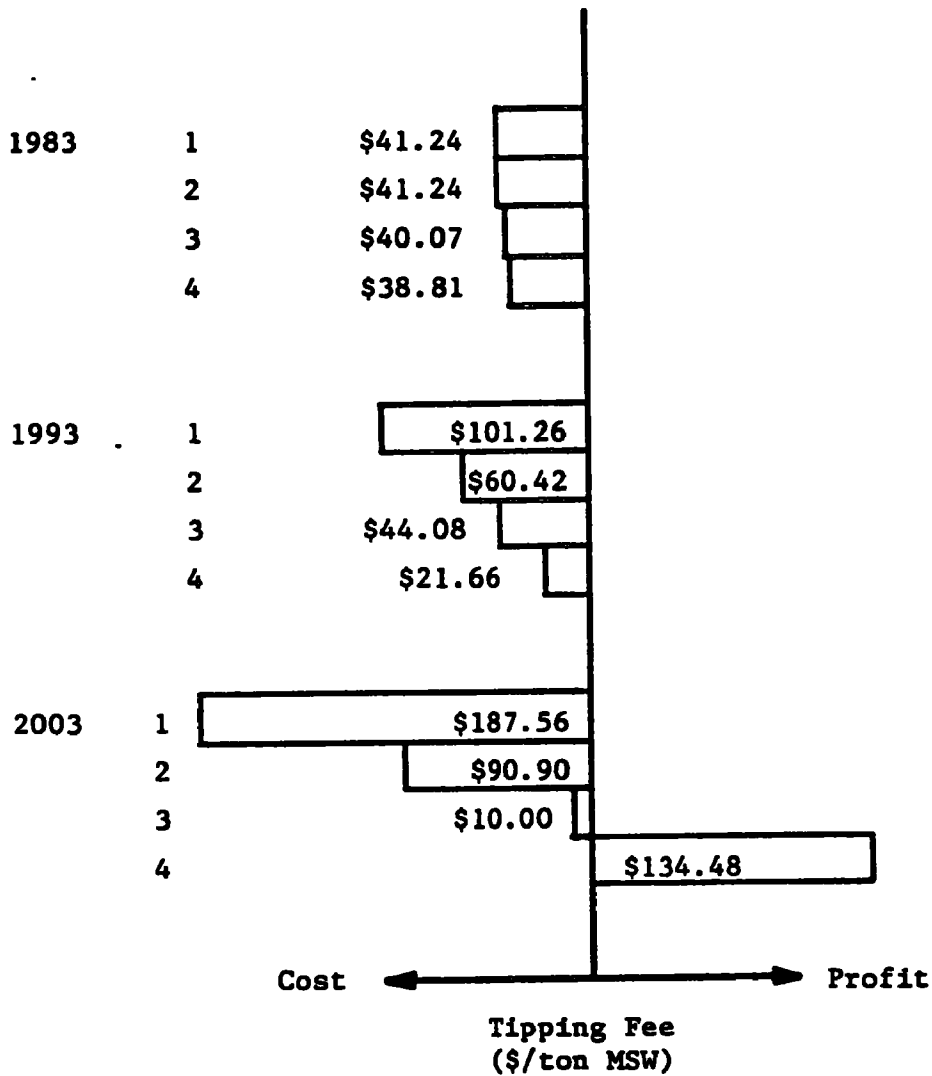


## Key:

- 1 - 9% escalation of energy revenues, steam sales agreement not renewed after 10 years, and given assumptions
- 2 - 9% annual escalation of revenues, steam agreement extended for 20 years, and given assumptions
- 3 - (baseline case) 12% annual escalation of revenues, renewed agreement, and given assumptions
- 4 - 15% annual escalation of revenues, renewed agreement, and given assumptions

FIGURE 4.3

## SENSITIVITY ANALYSIS ON WOOD BASED ENERGY REVENUES



## Key:

- 1 - 9% annual escalation of steam revenues, steam sales agreement not renewed after 10 years, and given assumptions
- 2 - 9% annual escalation of revenues, steam agreement extended for 20 years, and given assumptions
- 3 - 12% annual escalation of revenues, renewed agreement, and given assumptions
- 4 - 15% annual escalation of revenues, renewed agreement and given assumptions



The effects of a switch to wood could actually cause net system costs to increase if wood chip prices only escalate at 9%. At a 12% rate system costs hold relatively steady until the debt service ends at which time costs decline.

## V. STRATEGIES FOR SYSTEM PROCUREMENT

The Waterville-Winslow Joint Solid Waste Disposal Facility Corporation (hereafter referred to as the Corporation) has several critical steps to complete before a resource recovery system can be constructed. Among these steps are:

- negotiation of waste supply contracts;
- negotiation of steam sale contract with Keyes Fiber Co. or another market;
- selection of procurement approach;
- selection of financing approach; and
- the sale of bonds.

This chapter will discuss the issues that must be addressed in completing these steps and will outline alternative implementation strategies for Waterville-Winslow.

First, the Corporation must gain control of the quantity of waste for which the facility is to be designed through the negotiation of waste supply contracts with surrounding communities. The economic evaluation in Chapter III will assist the Corporation in developing a price structure for tipping fees (user charges) to be assessed these communities for using the proposed facility.

A steam contract with the Keyes Fiber Corporation must be negotiated and signed before design or construction begins. In Chapter II, Gordian has discussed the terms of the steam agreement being considered by the Corporation and Keyes Fiber Company and recommendations are made for adjustments along with possible negotiating strategies.

The Corporation must also select procurement and financing approaches consistent with its goals as stated in the "Waterville-Winslow Interlocal Solid Waste Agreement and Waterville-Winslow Joint Disposal Facility Corporation Certificate of Organization of a Corporation and By-Laws." This document is included in Appendix 1.

There is an element of risk involved in any resource recovery project and a general discussion of this issue is included in Section 3 and in Appendix 2. It is important, when considering the procurement strategy for a resource recovery project, to allocate the risks among

the project participants in a fair and equitable manner. Those entities that accept these risks should also share the benefits that result from the project.

The project proposed by Waterville-Winslow has two major areas of risk associated with the contracts for waste supply and the energy market. These risks have been discussed in previous Sections and will not be addressed further here, except to emphasize that the Corporation must be aware of them and the contracts negotiated (and the project management framework adopted) must take into account these and other risks.

## FINANCING

Resource recovery system development involves many complex decisions regarding appropriate financing mechanisms. One of the biggest problems in financing capital intensive resource recovery systems is that resource recovery systems cannot yet be generally sold as "off-the-shelf" facilities; they involve certain risks. Thus, regardless of the financing mechanism(s), investor concerns associated with the risks must be minimized. The major concerns in the financial community center on whether the municipal and private sectors can be brought together in workable contracts; whether the processes selected are technically feasible and reliable and the participating parties in the project understand the risks and have divided the risks according to which ones they are best able to manage; whether the waste stream(s) intended for the project(s) can be committed and controlled over a long term period; and whether there are reliable long term markets for recovered products, particularly energy, since bondholders tend to disregard the reliability of other product markets.

Obviously, there are other concerns such as credit backing and insurance, contractor expertise in design, construction and operation, emergency alternatives for waste disposal, and adequate "coverage" ratios in the project revenue structure.

While there are several public and private financing arrangements available for resource recovery system development, most projects being developed today involve some combination of the two and the application, at least in-part, of tax-exempt debt instruments. Straight private equity financing of a total project is unlikely. A private company expects a return on its investment which is consistent with the risks (and at least equal to the return) from a similar investment of capital. Too, most companies want to keep the financing of resource recovery projects "off-the-balance-sheet" since the debt would be too large for them to absorb. Most resource recovery projects could not withstand the profit payout required from a total private financing nor could most private companies secure the amount of funds needed for a large scale facility.

Private equity can, however, be successfully combined with public financing (i.e., revenue bonds) in the development of such projects. Such financing still involves risks but it can reduce total project capital costs since the private investor(s) may be able to take advantage of the Federal tax benefits such as accelerated depreciation, investment tax credits, and interest deductions. These benefits can afford substantial cash flow advantages to the private sector participant(s) in the early years of the project and such savings can be passed on to the participating municipalities in the form of lower tipping fees.

It is important to briefly examine the relative benefits of public ownership and operation versus private ownership and operation when discussing financing alternatives. Most advocates of public ownership and operation point to the lower costs of capital and the retention of municipal control over the facility. Too, the profit factor is obviated and the public body retains ownership after the debt is paid back. Public bodies may also believe they have greater leverage to negotiate with the proposed energy customer(s) in their jurisdictions.

On the other hand; private industry may be better equipped to operate and manage a technically complex facility and market the products successfully. It also has the profit motive as an incentive for efficient operation and can usually offer higher salaries to attract the necessary skills to operate the facilities. While the cost of capital to a private developer may be higher than for a public entity, a properly structured financing could afford the private firm Federal tax benefits - otherwise lost to a public body - that could enhance the overall economics of a project.

Regardless of the financing arrangements, a private system company that would design and/or build a plant should have a major stake, if not through ownership and/or operation, at least through strong performance guarantees to the owner/operator. The choice of public versus private facility ownership should be made by the local public officials based on local conditions and objectives.

The following review of financing alternatives is provided as a guide to the current status of financing for resource recovery projects.

Although some of the more intricate financing approaches, such as leveraged leasing, are perhaps more appropriate where large-scale facilities are concerned, Waterville-Winslow should be aware of the full-range of financing alternatives available before final decision financing is made.

### Public Financing

Local governments typically purchase equipment and facilities from current revenues or borrowings. It is common to find municipalities financing solid waste collection equipment, landfills and landfill equipment, and certain other facilities through current revenues (i.e., "pay as you go"). For more capital intensive projects, municipalities must often obtain bank loans, lease the facilities or else pursue long-term financing alternatives involving issuance of bonds. The bonds may include general obligation issues or municipal revenue bonds, and they are usually exempt from Federal income tax, which makes them attractive to investors.

Section 103(a) of the Internal Revenue Code of 1954 provides that gross income does not include interest on obligations of a state or political subdivision of a state. This same tax exempt treatment is extended to interest on industrial development bonds used to finance solid waste disposal facilities under section 103(b) of the code. Pollution control revenue bonds, which are issued by a public entity on behalf of a private enterprise to enable it to obtain low cost financing for pollution control, are also covered under the code. They carry tax exempt status and are similar in form to municipal revenue bonds; however, the credit rating of the corporation and its guarantee of revenues are key to the marketability of such bonds.

The major approaches to long-term financing for capital intensive facilities and/or equipment are presented as follows:

### General Obligation Bonds

Usually the easiest financing approach in resource recovery development involves the issuance of general obligation bonds. Such bonds are backed by the full faith and credit of the municipality (could be more

than one municipality) issuing them. In other words, the municipality pledges its taxing power without limit as to rate or amount to ensure payment of the debt rather than relying only on project revenues. For a community with a very good bond rating, the financial community does not examine G.O. bonds as closely as other financing instruments and thus, some projects could be developed without certain key project elements in place, i.e., lack of long-term market agreements.

In general obligation bond financing the municipality is normally required by law to secure voter approval for the bond issuance. Thus, the project may come under close public scrutiny if not close examination from the investors. There are some recent examples of resource recovery facilities being financed with G.O. bonds. Among these are an RDF project in Ames, Iowa, the Crawford RDF plant in Chicago, and RDF/dedicated boiler projects in Dade County Florida and Columbus, Ohio. Most of these projects involve a strong public works department and/or a municipal utility as the energy market.

It is important to note that many municipalities may be near their legal debt limit or have poor credit ratings and thus, not find general obligation bond issuance a viable option for resource recovery project financing.

### Revenue Bonds

Revenue bond financing typically involves the issuance of municipal bonds or industrial development authority bonds secured by the revenues of the project and not the taxing authority of the issuing entity. The revenues include the "tipping fees" or payments for service made by the users of the project facilities, and, in a resource recovery project, would also include revenues received from the sale of products such as steam, electricity, ferrous metals, or other energy and materials.

These bonds usually require an interest rate ranging .5% - 1.5% higher than for general obligation bond financing. Further, they will come under very close scrutiny by the investment community since they are not secured by "full faith and credit" of a municipality. For such bonds to be marketable in financing a resource recovery project, there typically have to be several security features in the project. The issuing

agency must be able to set rates and charges sufficient to cover debt service and all operation and maintenance on the project over its life. Bond underwriters will typically look for contractually committed fees and revenues minus operating and maintenance costs sufficient to provide "coverage" of 1.25 - 2 times the capital charges. Additional requirements in the bond resolution may include the establishment of various reserve and contingency funds.

The issuing entity, whether a municipality or municipal authority or other authority arrangement, must have the ability to "control" the waste stream and to control private collectors to ensure sufficient waste quantities and, thus, revenues to the project. In addition, firm, long-term contracts of a "put or pay" nature whereby one or more energy markets agree to purchase a minimum quantity of energy and pay a minimum amount for it whether they use it or not must be secured before the financing can be completed.

Revenue bond financed projects need not be strictly municipal. They may include private operation and, in certain cases, private ownership where the tax benefits to a private entity or the lower "effective" cost of capital would be attractive to a private company capable of owning and operating a facility. While the interest rate on a revenue bond may exceed that of a general obligation bond by as much as 1.5% the tax benefits of ownership that would accrue to a private entity could total 2 or 3%. In this manner, some of those savings could then be passed on to the communities in the form of lower tipping fees.

It is important in structuring any resource recovery project financing that the goal of municipal control in protecting the public interest while still providing for the opportunity for private operation (and possibly ownership to the extent it would qualify the private firm(s) for tax benefits) is fully considered. The participating communities must have strong guarantees from an experienced company with a proven track record and an incentive to make the project work in conformance with local conditions. Yet, both public and private groups must be willing to assume certain risks they can best assume and share others that they cannot fully absorb.



A more complex method of financing involving a mix of public and private investment is discussed in the next section.

### Leveraged Leasing

This form of financing involves the participation of a private entity investor(s) in 20% - 40% of the project costs and the leveraging of that investor's funds with the tax-exempt financing of the remainder of the project costs and the benefits of tax ownership the private investor can claim. The private investor becomes the owner/lessor of the project and would, in turn, lease the facilities to another private entity termed the user/lessee. In the case where the user/lessee is able to take full advantage of the tax benefits of ownership, it may not be economically viable to pursue leveraged leasing.

The equity investor must finance at least 20% of the cost of the project and maintain that throughout the lease term. The remainder could be financed with industrial development bonds or the long-term obligations (GOB or revenue bond) of a municipality or trust. The equity investors, typically one or more individuals in a very high tax bracket, are able to shelter part of their other income through the tax benefits of ownership. In this manner and along with the cash flow from lease rental and the residual value of the project, the investors earn a sufficient return on investment and the community is able to reduce its amount of capital required as well as the effective interest cost of the capital for a resource recovery project (although leveraged leasing is not restricted to resource recovery projects).

It is appropriate to obtain an IRS advance ruling on a leveraged lease financing to ensure that the arrangement is, in fact, a true lease and the equity investors qualify as the project owners for Federal income tax purposes. In addition, the IRS has set forth several rules and conditions relative to this type of financing which may make it difficult for certain contemplated arrangements to qualify and which must be carefully evaluated in structuring this rather complicated form of financing.

Recently, leveraged lease financing for resource recovery projects has received interest from commercial banks and at least one is pursuing this approach rather aggressively. Under this approach, the bank would become the paper owner of the project and arrange a lease with a silent partner who would put up 25% - 40% of the equity and accrue the ownership tax benefits.

The lessee, either a private operator or a municipality, enters into a construction contract with a builder who would construct, test, and deliver a project meeting required specifications. It would also enter into waste disposal contract(s), energy sales contract(s), and perhaps materials sales contract(s). Payments received under these contracts are designed to cover lease rental and operator fees. At the end of the lease, the lessee would typically have the option to purchase the project at fair market value.

In the optimum case when 40% private equity is provided, the difference in effective interest rates on total capital requirements between this financing approach and other forms of debt could be as much as five percentage points.

### Other Financing Programs and Incentives for Resource Recovery Projects

There are several Federal grants, loan and loan guarantee programs that afford assistance to resource recovery project financing and serve as incentives to develop projects that might not otherwise be financeable. This is not to say that if a project is not economically sound it should be pursued using one or more forms of Federal financial assistance.

Included in recently developed financing incentives are several modifications of current law and addition of new programs for resource recovery, primarily energy recovery projects, under the Crude Oil Windfall Profits Tax Act signed into law in April 1980. Other programs are described below.

### Current Federal Programs for Capital Funding of Resource Recovery Projects

#### (1) Co-Disposal of Sewage Sludge and Solid Waste

Resource recovery projects that include the co-disposal of sewage sludge and municipal solid waste may qualify for direct grants under Section 201 of the Clean Water Act.

This program has been used to fund other co-disposal projects to date and may be used to fund part of the costs of the equipment to process and combust sewage sludge.

#### (2) Department of Energy Programs

The U.S. Department of Energy provides several programs for resource recovery financing assistance. Among these programs are a \$15 million demonstration grant program for new technology, a recently announced program for alternative fuel production projects which is not yet defined for municipal waste resource recovery type projects, a loan guarantee program to provide Federal guarantees to finance waste-to-energy projects that may not otherwise be financeable such as in communities with low credit ratings, and a limited price support program which provides cash subsidies to energy recovery projects during the first several years of operation (usually when cash flows are lower),

which are repaid during the later years of a project when cash flows are greater. This program is described in more detail in Appendix 3.

The Department of Energy also has an "entitlements" program which provides direct subsidies to municipal solid waste-to-energy produced; however, this program expires in 1981, well before any facilities could be implemented in Waterville/Winslow.

#### SBA Loans

The Small Business Administration maintains an Energy Loan program and a Pollution Loan program, which provide lower interest loans to qualifying small businesses for the development of various energy savings and pollution control projects or the purchase of related equipment. These loans are limited to a maximum of \$5 million each at present.

#### Recommended Financing Approach

Gordian recommends that the City of Waterville and the Town of Winslow each fund its respective share of the initial capital costs through the issuance of general obligation (G.O.) bonds, provided that:

- its bond rating is sufficient to ensure an attractive interest rate; and
- its debt ceiling will not be surpassed.

Under optimal circumstances, G.O. bonds provide the lowest interest rate and ensure the ownership of the facility by the Corporation.

## PROCUREMENT

### Alternative Procurement Approaches\*

There exist several methods for procuring resource recovery facilities and for their operation. These methods have been discussed in detail in a report previously issued to the City.

Resource recovery procurement is a process by which decisions made in the selection phase regarding system type are systematically translated into an operational facility. This process involves contractor selection, contract negotiation, facility construction, and operational testing. Because the process tends to be both legally and administratively complex, a carefully considered procurement strategy is essential for successful implementation.

There are three basic strategies, or procurement options, that can be followed, as shown in Figure 5.1. The first is the traditional architect-engineer approach (A&E); the second is the turnkey approach and the third is a full service approach. There are, however, potential modification to each approach. The choice of one strategy over the other depends largely upon the issues of ultimate facility ownership, the allocation of risks between the City and private contractors, legal restrictions, and the availability of financing.

### A&E Approach

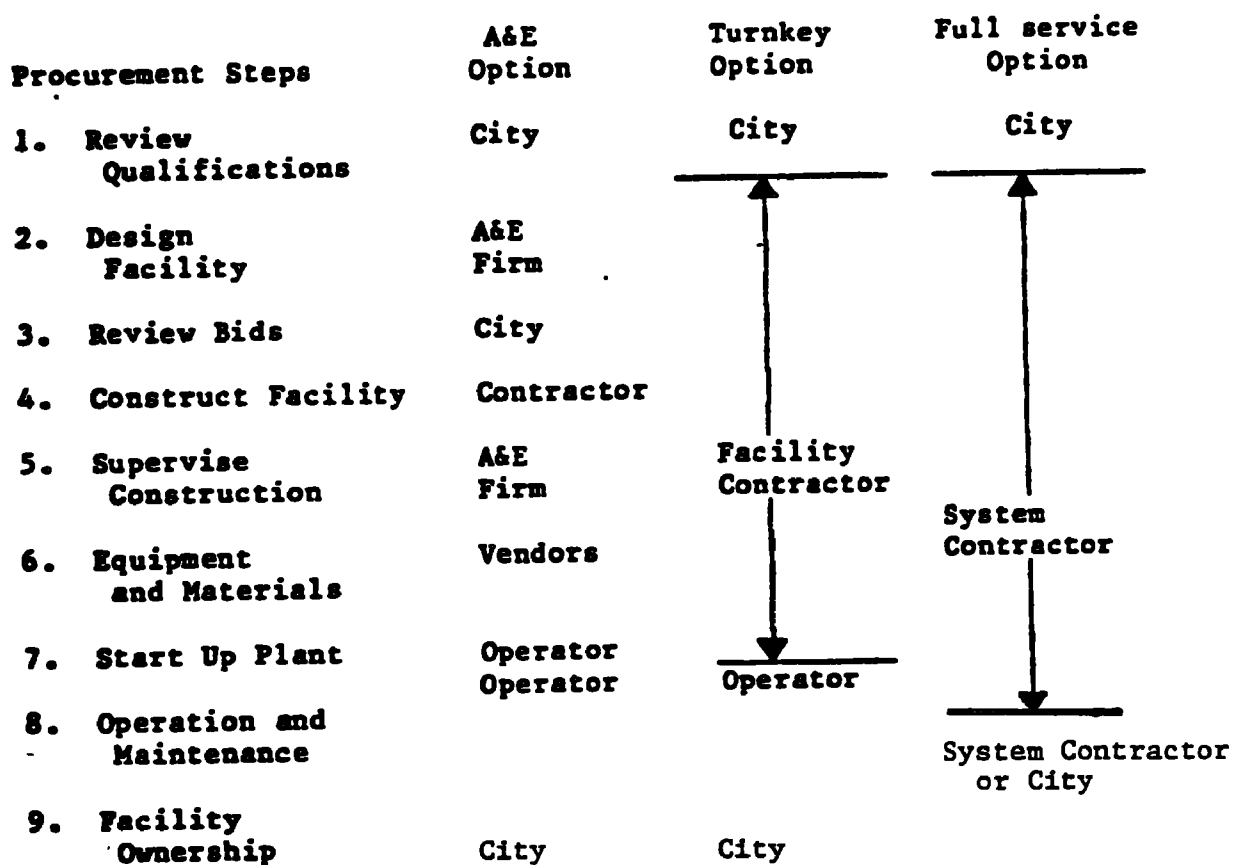
The A&E approach is the strategy cities have traditionally used to procure sewer systems, roads, schools, and other public works. It normally involves two separate procurements - one for engineering services and another for facility construction. Initially, an A&E firm is selected on the basis of its past experience and present capabilities in the general type of resource recovery system desired by the City. The firm draws up the final engineering designs and helps the City to prepare an invitation for bids (IFB). The City then reviews the bids submitted by contractors and awards a contract for the construction of the facility on the basis of lowest cost. In the A&E approach, the consulting

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\* This discussion was derived mainly from "Procurement Strategies, Choices, and Contractual Methods Explored" by P. Aarne Vesilind and Dennis Warner, Solid Waste Management, April 1978.

FIGURE 5.1

**RESOURCE RECOVERY PROCUREMENT RESPONSIBILITIES  
UNDER THREE DIFFERENT ACQUISITION STRATEGIES**



Source: Ibid, A. Vesilind, D. Warner

engineers often provide continuing services to the City in the form of construction supervision and monitoring of final plant shakedown.

#### Turnkey Approach

An alternative procurement option is the turnkey approach, in which the City contracts with a single contractor for a complete package of facility design, construction, equipment supply, and start-up. The contractor is required to satisfy various acceptance criteria in turning over to the City a fully operating facility. A modification of this option is to have the contractor also operate the facility for the City. Turnkey contracts usually are awarded on the basis of a request for proposals (RFP) issued by the City. An RFP states in general terms the type of system wanted by the City and allows interested contractors the opportunity to propose comprehensive, and possibly unique, solutions for which they have special capabilities.

### Full-Service Approach

The third option is the full service approach involving total implementation, operation, and possible ownership by a private firm. As in the case of the turnkey option, the City issues an RFP, but the contract is for a resource recovery service instead of a plant. The selected contractor is responsible for project financing, design, construction, equipment supply, start-up, and subsequent operation of the facility. The full-service contractor may own the facility and be solely responsible to the bondholders for repayment of the financing loan. The owner in this case would seek to back up his responsibility to the bondholders with long term contracts for assured waste supply and tipping fees from municipalities and for sale of by-products, energy and materials. In this case the owner would receive all tax benefits.

If the municipality or solid waste authority owns the facility, the operator may lease the plant and repay the bondholders via the plant owner in equal payments for the term of the lease. Under this arrangement the plant operator may be entitled to all profits or may be required to share revenues in excess of a predetermined return on investment with the plant owner. Under such a financing mechanism the lessee (plant operator) is, for tax purposes, considered owner of the plant, although title still resides with the municipality or authority. As such, the lessee (operator) of the plant is entitled to the full investment tax credit of between 20 to 30% and the accelerated tax depreciation.

Alternatively, the contractor or operator may act solely as the plant operator without leasing under contract to the owner (municipality).

Successful cases of all three types of contracting strategies can be found. One of the first to use the A&E approach was Ames, Iowa, which since 1975 has had a fully operational 200 TPD system producing refuse derived fuel, baled paper, and metals. On the other hand, Auburn, Maine adopted the modified turnkey approach and expects to have a 200 TPD plant producing steam in 1980. The full service approach is well illustrated in Bridgeport, where an 1800 TPD plant producing refuse derived fuel, metals, and glass expects to be operational in 1981.



Within the context of the three procurement options, there are two basic methods for reaching contractual agreements between the City and the suppliers of services, facilities, and equipment. The first method can be termed competitive procurement, because it utilizes formal advertising and the selection of the lowest responsive bid according to well-defined specifications. Since it is the traditional method used in the A&E approach, competitive procurement is a widely used procedure in public works implementation and is well understood by city personnel.

The competitive procurement method begins with an examination of the qualifications of A&E consulting firms by the city. The selected firm normally is chosen on the basis of its relevant resource recovery experience, the type of recovery system desired by the City, and the results of negotiations between the City and the firm. This portion of the competitive procurement method is not price competitive, although the remainder of the process is. The consultant then carries out final system designs and helps to prepare an IFB containing detailed specifications of the type of system desired. The resulting bids from potential contractors are price competitive, since they are evaluated on the basis of both technical merits and cost.

The second method for arriving at contracts is termed negotiated procurement, and it applies primarily to the turnkey and full service procurement approaches. Negotiated procurement has not been widely used in the acquisition of public works, and it occasionally runs into restrictions from state laws requiring competitive bidding on the basis of price. Although competitive procurement is well suited to systems which can be clearly specified in advance, a growing number of state and local governments are coming to realize that negotiated procurement is far more effective in the acquisition of systems whose technology, markets and operations contain many uncertainties at the time of contract negotiations.

The heart of the negotiated procurement method is the RFP, which generally solicits bids on the basis of specifications more broadly drawn than those in an IFB. In general, an RFP for a turnkey approach will contain more technical detail than one for a full service option. Nevertheless, the use of an RFP shifts much of the design responsibility

to the contractor and, hopefully, provides the city with a wide range of proposed technical solutions. Following proposal evaluation, a winning contractor (or set of finalists) is selected and the City then enters into contract negotiations with this firm. Any necessary deviations from the RFP must be considered at this point. Furthermore, the contract should contain sufficient flexibility to allow the contractor to adjust to unanticipated technical and financial changes in the systems. Without this flexibility, the increased risks borne by the contractor will be reflected in higher contract costs to the city.

#### Implementing Agency's Philosophical Posture

The implementing agency's philosophical posture is very important to consider in determining which procurement approach will be undertaken. Remembering that the primary purpose for undertaking a resource recovery project is to provide for the sound disposal of solid waste without creating a public health hazard or an environmental pollution problem, municipal officials are faced with deciding between traditional and nontraditional approaches.

Resource recovery companies exist which are willing to provide equipment and/or services to address municipal needs under any conceivable project structure that can be effectively applied. Various projects have been implemented under very different structures reflecting the posture of the local officials as well as the availability of alternatives that are believed to exist.

Municipal officials will need to decide what degree of control they wish to have in maintaining the public health aspects of solid waste disposal, either directly or through contracts for service. Similar decisions will need to be made regarding which capital financing vehicle can be used. The availability of financing approaches and mechanisms does affect the procurement decision. Similarly, decisions must be made with regard to the degree of support it will commit over the life of the project for the operations - either through commitment of certain minimum quantities of solid waste or through a guaranteed payment for receiving the service of disposal through recovery.

Basic to these decisions is the degree of control that the City of Waterville and the Town of Winslow would like to maintain over the facilities' operations. For greatest control, the municipalities should maintain ownership through the Waterville-Winslow Joint Solid Water Disposal Facility. The control is less direct if ownership does not lie with an entity which is accountable to the participating municipalities. If adequate capacity for sanitary landfill exists in the future and at a reasonable cost - less than projected at this time for resource recovery - then it may be advisable to allow others to own the facilities. If problems arise, disposal could be provided by sanitary landfiling directly.

As discussed earlier, even if publicly owned, the facility can be privately operated as well as designed and constructed by the same entity. As public agencies usually have less flexibility to hire/fire staff resources, consideration of this posture may become a necessity for the operation of resource recovery equipment.

#### Small System Procurement Experience

A growing number of small resource recovery systems are being planned and implemented. The experiences of the projects that have moved forward into construction and operation phases are reviewed briefly here to provide perspective. Presented in Table 5.1 is a listing of twelve localities that are either operating or constructing small modular units. The procurement methods followed by these localities are summarized as follows:

As can be seen, the A&E approach has most often been used in the procurement of small systems. However, two recent procurements - Auburn, Maine and Pittsfield, Massachusetts - and North Little Rock's recent award of the operating contract to Consumat Systems Inc. indicate a new trend in municipal procurement of small systems as well.

A review of the decision-making process in these locations is presented here for background purposes.

#### North Little Rock

In 1971, North Little Rock purchased two small incinerators (12.5 tons per day per unit) without energy recovery capability to handle their growing volume of solid waste. However, the units were never

TABLE 5.1  
MODULAR COMBUSTION PROJECTS

*The following localities are either operating or constructing small modular combustion units to produce steam from mass combustion of municipal solid waste:*

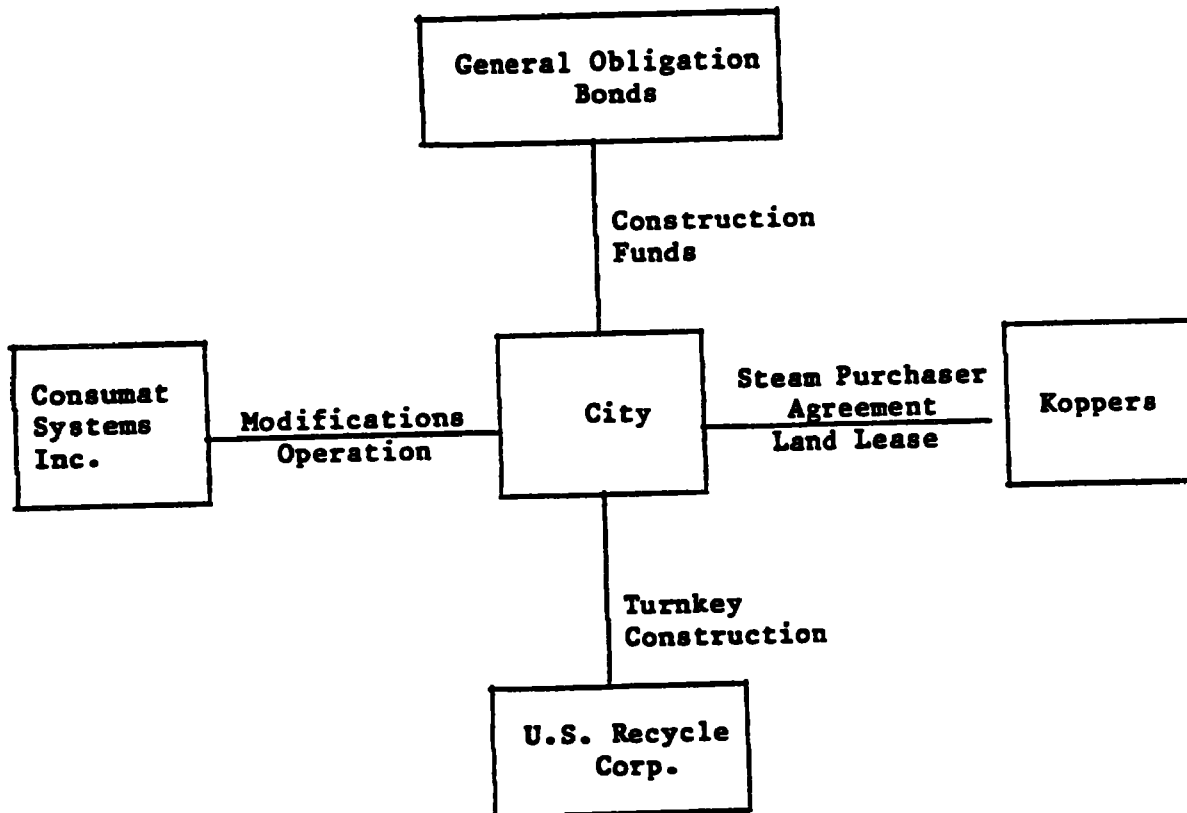
LOCATION	MANUFACTURER	REPORTED CAPACITY (TPD)	REPORTED CAPITAL COSTS (MILLIONS OF \$)	STATUS	CONTACT
Auburn, Maine	Consuamat	150	3.2	Design contract, funded by DOE, signed energy use and operator contracts signed construction began Aug. 1979, startup planned for Nov. 1980	Robert Belz Public Works Auburn City Hall 45 Spring St Auburn, Maine 04210
Blytheville, Ark.	Consuamat	75 to be processed	N/A	Temporarily shut down for installation of additional units	Tom Little, Mayor City Hall Blytheville, Ark. 72315
Crossville, Tenn.	Smoketrol	60	1.11	In shutdown, undergoing modifications	Nelson C. Walker Gen. Mgr. Environmental Services Corp. P.O. Box 765 Crossville, Tenn. 38555
Dyersburg, Tenn.	Consuamat	100	2	Under construction, startup scheduled in early 1980	Alderman Bob Kirk Colonial Rubber Dyersburg, Tenn. 38024
Genesee Township, Mich.	Consuamat	100	2.0	Began operations in Feb. 1980	Hanumanthaya Marur, P.E. Township Engineer 7244 North Genesee Rd. Genesee, Mich. 48437
Groveton, N.H.	Environmental Control Products	24	N/A	Operational since 1975	Rich Caville Groveton Paper Mill, Inc. Groveton, N.H. 03582
Lewisburg, Tenn.	CICO	60	N/A	Under construction; to be in operation in July 1980	John D. Lambert City Manager 505 Ellington Pkwy., Rt. 1 Lewisburg, Tenn. 37091
North Little Rock, Ark.	Consuamat	100	1.45	Operational 1976-1979, presently undergoing modifications. City awarded contract to Consuamat Systems, Inc., for modifications and long-term operation, scheduled to re-open in March 1980	Mike Butner President U.S. Recycle Corp. P.O. Box 7561 Little Rock, Ark. 72217
Osceola, Ark.	Consuamat	50	1.1	Began operations in Jan. 1980	R.E. Prewitt, Mayor City Hall Osceola, Ark. 72370
Pittsfield, Mass.	Vicon Recovery Assoc. (Emerson designed incinerators)	240	6.2 <sup>m</sup>	Construction to be completed in Sept. 1980	Joseph J. Dumas, Jr. President Vicon Recovery Assoc. P.O. Box 100 Butler Center Butler, N.J. 07405
Salem, Va.	Consuamat	100	1.9	Operational in 1979	William Paxton, Jr. City Mgr. P.O. Box 869 Salem, Va. 24153
Salem Springs, Ark.	Consuamat	16	A	Operational since Sept. 1975 (Presently being used as incinerator only)	Al Vorwig, Dir. Sanitation Dept. 410 North Broadway Salem Springs, Ark. 72761

installed because of political problems relating to siting. In 1974, U.S. Recycle Corporation, a franchised dealer of Consumat Systems, Inc. proposed that the City operate a modular incineration system with energy recovery and that it sell the steam produced from the system to a potential market - Koppers Company. After favorably receiving a U.S. Recycle study which included a discussion of potential project economics, along with positive discussions with Koppers regarding the apparent feasibility of a Consumat System meeting steam requirements, the City decided in 1975 to pursue the energy recovery system. From 1976 to mid-1977 contracts were negotiated and the facility was constructed. In September 1977, the City began operating its own modular incineration system that was contractor-designed and constructed. The turnkey approach was not operating to the City's satisfaction, however, and in March of 1980, the City turned over the operations of the facility to Consumat (Figure 5.2).

The City had determined that it would own and operate the facility from its start. However, Consumat assumed responsibility for the daily operation of the facility when it was determined that City personnel were not properly carrying out required tasks. Under the new arrangement, the City receives all revenue from steam sales and pays Consumat a flat fee for facility operation. Consumat assumes all risk for the quantity of materials required for daily operations. The operating contract is limited to one year due to state law, but it appears that Consumat's direction of operations will continue at least until the steam contract with Koppers terminates.

In selecting the contractor, the City was required by state law to carry out competitive bid processes except in "exceptional situations where such procedure is deemed not feasible or practicable." The RFP was very detailed in that it included proposer qualifications criteria in the bid package for the design, construction, and equipping of the facility. Proposers had to have had at least two years of demonstrated experience providing similar systems for processing municipal refuse and with at least two projects involving municipal solid waste processing and in providing steam to a user which required a uniform and uninterrupted supply of steam. The RFP was released in November 1975 and contract negotiations were culminated in April 1976. U.S. Recycle/Consumat, the selected

FIGURE 5.2  
NORTH LITTLE ROCK CONTRACTS



contractor proposed a fixed price for the equipment, supervision of installation, training of City employees during the first year of operation, and equipment testing at the end of one year to determine performance quantities. Project costs were financed from a special revenue bond issue and from available city funds.

The City retained a local engineering firm to prepare plans and specifications for plant building construction and equipment installation. U.S. Recycle also provided assistance in the preparation of specifications and offered to meet with each prospective bidder to describe the Consumat equipment installation requirements in order to aid in the bidder's cost estimates and guarantee proper installation. Bids were opened in early June 1976 and a contract was awarded to the lowest bidder two weeks later.

In June 1976, the City and Koppers signed contracts for the purchase of steam, including a provision for the project to utilize Koppers' wood wastes, and for a site lease. The steam purchase agreement provides that Koppers will purchase steam requirements of Koppers' Forest Products plant. The price of steam was pegged to the lowest cost fuel available to the Forest Products plant. Koppers must approve the City's plans and specifications for the modular incineration units. The steam purchase contract did not include a guarantee by Koppers to purchase a specific amount of steam, only that it purchase the amount required for current operations. The wood waste agreement is for one year with an annual renewal option. It was felt that woodwaste would serve as an auxiliary fuel source for weekend operations, if operations were expanded, but nothing has happened to date. Koppers will provide woodwaste to the City at no cost. The site lease contract covers a 20-year period, where the City is obligated to pay a rental of \$1 per year and all property tax assessments and improvement charges.

#### Pittsfield, Massachusetts

The Pittsfield plant will be designed, constructed and operated by Vicon Recovery Associates, a subsidiary of Vicon Construction Co. The steam will be sold to a nearby paper company, Crane & Co. Project shake-down is expected to begin in November 1980 and last for four to six months.

The financing for the project was provided through tax-exempt pollution control revenue bonds sponsored by a local industrial development authority.\* The bonds are guaranteed directly by Vicon Construction and indirectly by Pittsfield's guarantee to deliver waste or pay tipping fees. The initial tipping fee is set at \$11.59 per ton. However, projections indicate profits to the operation which are to be shared 50/50 between Vicon and Pittsfield, thus reducing Pittsfield's upfront tipping fee.

The RFP was prepared by the City engineering and investment consultants. It stated that the City was willing to enter into a put-or-pay contract for delivery of solid waste, to provide a site for the facility as well as a residue and emergency landfill site, and to aid the contractor in obtaining tax-exempt financing. The RFP also identified Crane & Co. as the steam customer. The RFP was advertised in March 1978 and two months later Vicon Recovery Associates was selected.

The steam purchase contract becomes effective in December 1981, or at an earlier date agreed upon by the company and Crane. The project has been set up for a 15 year period. The company must construct the facility and assume all costs relating to steam producing facilities as well as lines and equipment for steam delivery. The company is required to sell and deliver, and Crane to accept and purchase, at least 700,000 lb of steam per day at a rate of at least 20,000 lb per hour for 240 Crane work-days. Steam prices will be based on Crane's cost for No. 6 fuel oil discounted by a negotiated rate.

Pittsfield has shifted the project's technical and performance risk to a private company which guarantees the design and its ability to process waste and generate steam. In return, Pittsfield accepted the responsibility to assure waste stream supply quantity and quality and to pay tipping fees if waste is not available for some reason.

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\* Robert H. Aldrich, "Small Resource Recovery Project Gets Disposal Revenue Bond Financing," in Solid Waste Management, January 1980.



### Auburn, Maine

Recognizing a disposal problem in 1974, a planning process was initiated to identify alternatives. In 1975, an energy recovery scenario was identified. Efforts began to crystallize in 1977 when the City prepared an implementation report which highlighted the problem and provided direction. Between 1977 and 1979, the City went through a decision-making process that led to a City-owned, contractor-designed, constructed and operated (over an initial 3 year basis) project. See Appendix C for more detail on the project.

The contract arrangements are depicted in Figure 5.3. The City decided early on to own the facility and eventually to operate it as well. However, current operating experience in other municipally-owned and operated systems convinced Auburn officials to modify their approach. They decided to give responsibility of design, construction and operation to one contractor. The initial operating phase was set at three years and allows for two five-year extensions.

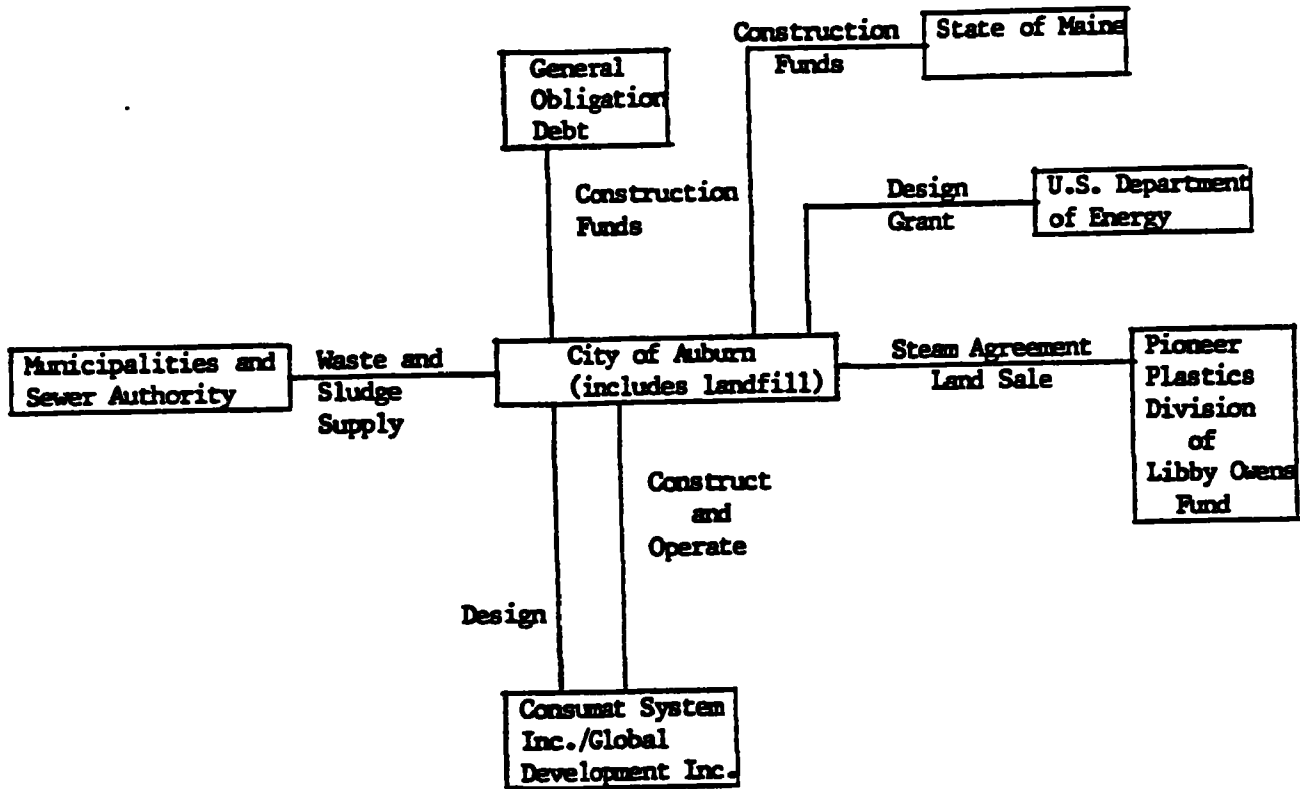
The City guarantees waste quantity and quality and, in the event of waste shortfall, an operating fee to the operation. Provisions for processing additional waste and sludge are provided. The City maintains control over additional waste through contractual arrangements with other municipalities and with the sewer authority for sludge supply.

In selecting the contractor, the City solicited a very detailed Request for Proposals describing the project and the contractual terms it was interested in offering. The RFP was released in December 1977, a contractor was selected in July 1978, and contract negotiations with the contractor and steam customer were concluded in October 1979.

The project is backed substantially by the steam sales contract. The revenue generation will be substantial. More importantly, the steam purchaser - a major U.S. corporation - guarantees to "take or pay" for steam. In the event that the steam user closes its facility in Auburn, the agreement also provides for continued payments equivalent to the principal and interest on the City's long-term debt for the project.

The project technology and performance risks are completely shifted to the contractor as long as it remains the operator of the facility.

FIGURE 5.3  
AUBURN, MAINE CONTRACTS



Performance incentive and penalty provisions are included in the operating specifications. The City has the right to take over the facility in the case of non-performance by the contractor over an extended period of time.

The Auburn project is an example of strong desire to both own and operate a resource recovery facility being tempered by recent experience elsewhere and recognition of the fact that the project has to be run as a business - the need to overcome City constraints in personnel and maintenance. It is also worth noting that the influence and participation of the energy user throughout the planning and contractor selection process was important to the project's success and significantly influenced project structure.

#### RECOMMENDED PROCUREMENT APPROACH

The by-laws of the Waterville-Winslow Joint Solid Waste Disposal Facility Corporation (hereafter referred to as the Corporation) permit it considerable latitude in the procurement which it may adopt. Article 3.3a would even allow the ownership of the facility to be assigned to a full-service contractor, provided the unanimous consent of the Joint Board was obtained.

Gordian recommends that the advantages of the full-service procurement approach should be examined carefully by the Joint Board. The operation and maintenance of a modular combustion facility require skills which a public corporation may find difficult to attract (as was shown by the experience of North Little Rock). In addition, the contractor is responsible for the construction and the performance of the system procured, and thus, shares some of the technical risks associated with implementing the project. (This latter advantage is also shared by the turnkey approach.) The ultimate control of operations would be retained by the Corporation through its ownership of the facility and its role in approving the annual operating budget for the facility.

## Alternative Procurement Strategies

### Overview of Strategies

The alternative procurement strategies available to the Corporation are displayed in Figure 5.4. The first priorities of any strategy are to secure contracts for waste supply and the energy market and to select the financing and procurement approaches to be taken (Step 1).

The A&E approach would then require that the Corporation advertise for and select an A&E firm to design the proposed facility (Step 2). This would include the development of specifications for the facility which would be used by the construction contractor.

Depending on the requirement of the Maine Department of Environmental Protection, an environmental assessment of the proposed project may be required at this stage (Step 3). Also in Step 3 (Preconstruction Planning) the financing and any required preconstruction permits should be secured. The sale of G.O. bonds may require voter approval and preparation for a referendum should be started well in advance.

Once the financing is secured, an invitation to bid (IFB) is issued for a contractor to construct the facility (Step 4). (IFB's for hardware vendors may also be issued.) Following selection of the construction contractor, construction can proceed.

Although the services being procured under the turnkey and full-service approaches are different, the procurement strategies used are essentially the same. As with the A&E approach, the Corporation must secure contracts for waste supply and the energy market as well as select the financing approach (Step 1). Following this in Step 2, an RFP for the turnkey or full-service contractor/system vendor is prepared and issued. The proposals submitted are evaluated and a contractor selected. A contract with the vendor must be negotiated and finalized. It is important that this agreement clearly define the roles and responsibilities of the contractor and the Corporation.

Generally, the contractor will prepare a preliminary design to facilitate the financing process and obtaining preconstruction permits in Step 3. This source will be provided one of the contractor's fee and this will be included as a capital cost. As with the A&E approach, some kind of environmental assessment of the project may be required.

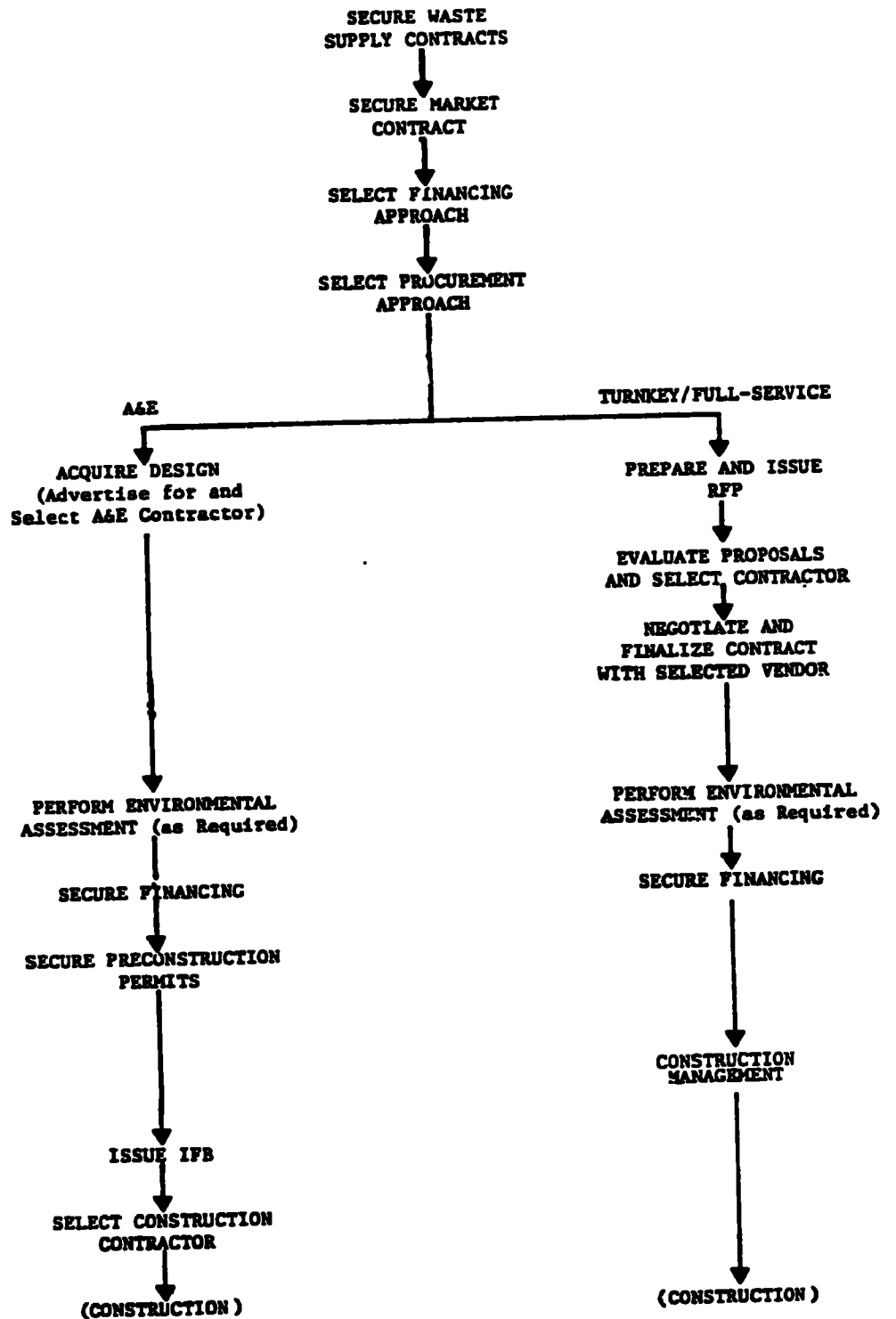
FIGURE 5.4: ALTERNATIVE PROCUREMENT STRATEGIES

**STEP 1. Procurement Planning and Contracts**

**STEP 2. Contractor Selection**

**STEP 3. Preconstruction Planning**

**STEP 4. Construction Contractor Selection**



Gordian strongly recommends that the Corporation employ a third-party engineering firm in Step 4 to supervise the contractor's planning, design and construction of the facility to ensure that the contractor meets the terms of the contract.

#### Procurement Schedule

An approximate schedule for procurement under the alternative strategies is shown in Figure 5.5. Gordian estimates that all alternative procurement strategies can result in ground-breaking within twelve months. This could be achieved over a shorter period for the turnkey/full-service approach depending on the time that elapses between issuing the RFP and finalization of the contract with the system vendor. The A&E approach will probably require the full twelve months since the design and preparation of specifications for the IFB by the A&E firm will be time consuming. In contrast, the full-service turnkey contractor will have this design information on hand.

However, it should be emphasized that unforeseen difficulties, such as the inability to finalize contracts, could delay project implementation considerably.

#### Procurement Costs

Estimates for the cost to complete the alternative procurement strategies, including both the cost of consulting and in kind services, are shown in Table 5.2. Gordian estimates that full-service/turnkey approach would cost \$120,000 compared to \$90,000 for the A&E approach. Although the estimated cost for the A&E approach is less than for the turnkey/full-service approaches, the overall cost may be greater due to a higher engineering fee which will result from the greater role the A&E firm takes in overseeing construction.

#### Project Management

The interlocal agreement that created the Corporation specifies the management structure to be adopted for the proposed facility. The only major option available to the Corporation is whether to operate the facility itself or hire a contractor. Project management for the former

**FIGURE 5.5** Approximate Schedule for Alternative Procurement Strategies

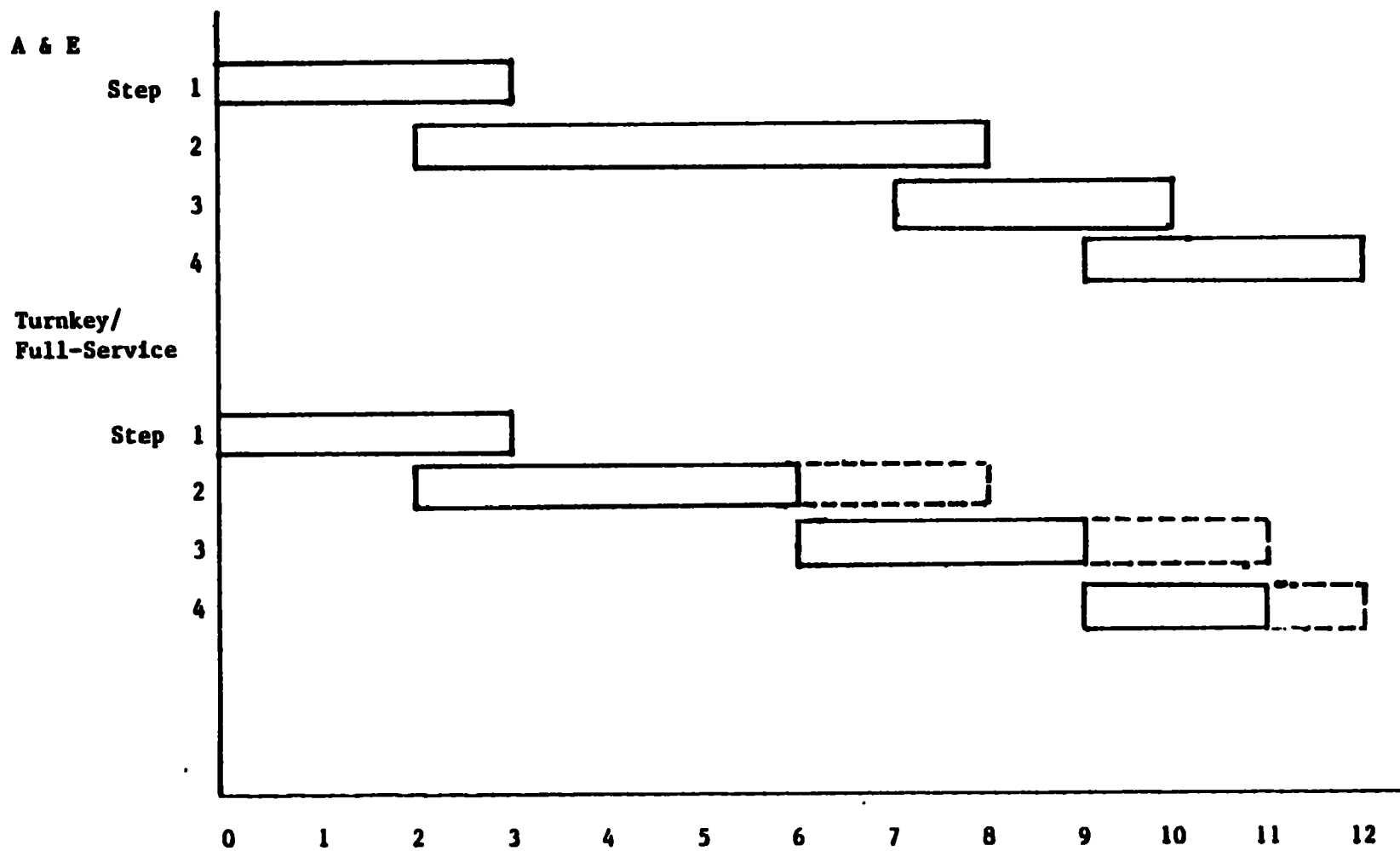


TABLE 5.2

Cost Estimates for Alternative Procurement Strategies

		Cost Estimate (\$ x 1000)	
<b>Step 1</b>		<b>Tasks</b>	
Procurement Planning and Contracts		a. Secure waste supply contracts b. Secure market contract c. Select financing d. Select procurement approach	
		Step Total	30
<b>A &amp; E PROCUREMENT</b>		<b>TURN KEY AND FULL SERVICE PROCUREMENT</b>	
<b>Step 2</b>		<b>Tasks</b>	
Contractor Selection		a. Advertise for A&E firm b. Evaluate qualifications and select firm	
		Step Total	10
		a. Prepare and issue RFP b. Evaluate proposals and select contractor c. Negotiate and finalize contract with selected vendor	
		Step Total	30
<b>Step 3</b>		<b>Tasks</b>	
Reconstruction Planning		a. Perform environmental assessment (as required) b. Secure financing c. Secure preconstruction permits	
		Step Total	40
		a. Perform environmental assessment (as required) b. Secure financing	
		Step Total	30
<b>Step 4</b>		<b>Tasks</b>	
Construction Contractor Selection		a. Issue IFBs b. Select construction contractor (and hardware vendors)	
		Step Total	10
		a. Construction management	
		Step Total	10
<b>TOTALS</b>		<b>90</b>	<b>120</b>



case is illustrated in Figure 5.6 by means of a cash flow diagram. The system operating costs will be paid by the Corporation from revenues from tipping fees, and energy revenues. Excess revenues would be returned to the participants (Waterville and Winslow) according to their share of the operating costs (levied on the basis of MSW processed by a tipping fee). The excess revenues would be used by the participants for debt retirement.

The project management would be only slightly altered if the facility operation were to be contracted privately, as is illustrated by a cash flow diagram in Figure 5.7. In this case, the system operating costs would be paid though by the operator who would receive an operating fee from the Corporation which would include a profit for the operator. The operator would also receive a percentage of the energy revenues. This would provide an incentive for the operator to maximize energy production and thus increase its profit.

FIGURE 5.6: CASH FLOW FOR FACILITY OPERATED  
BY THE CORPORATION

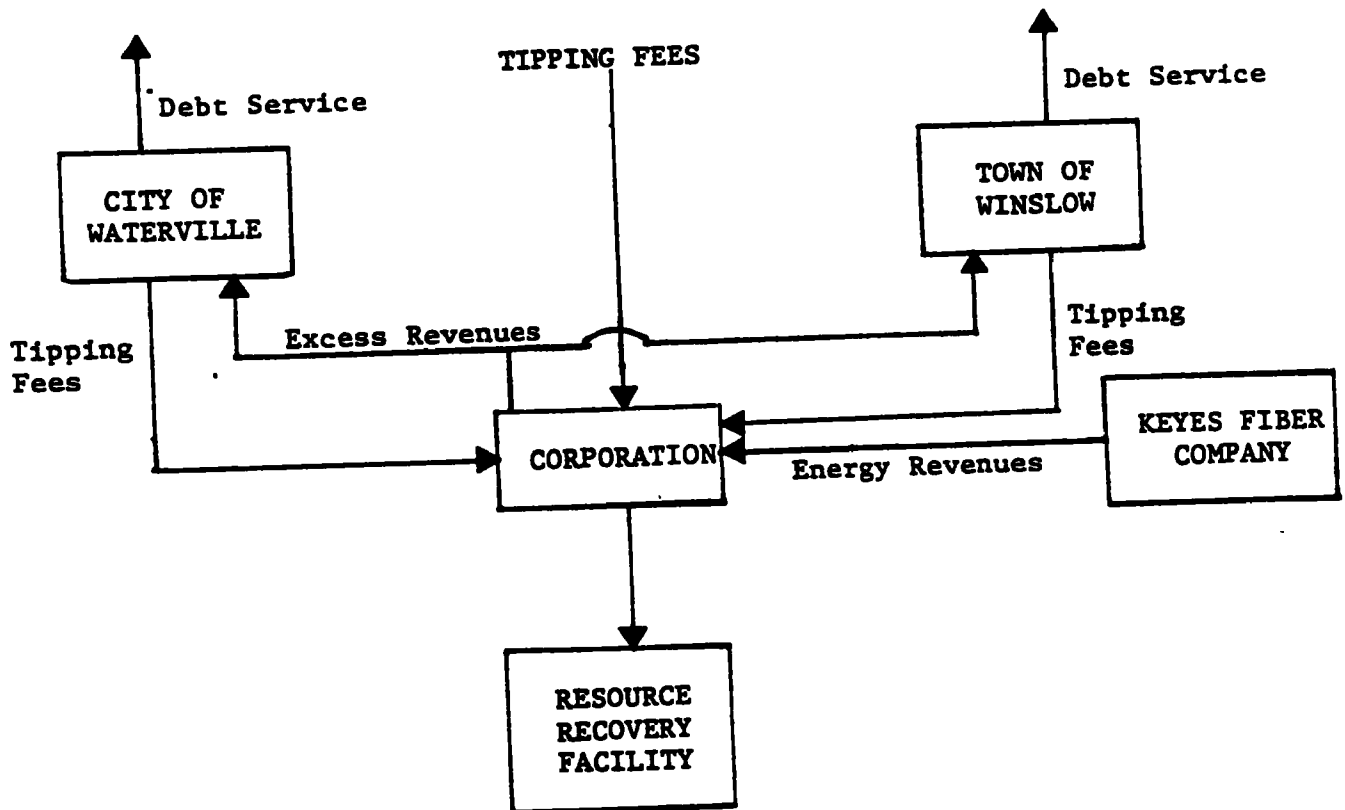
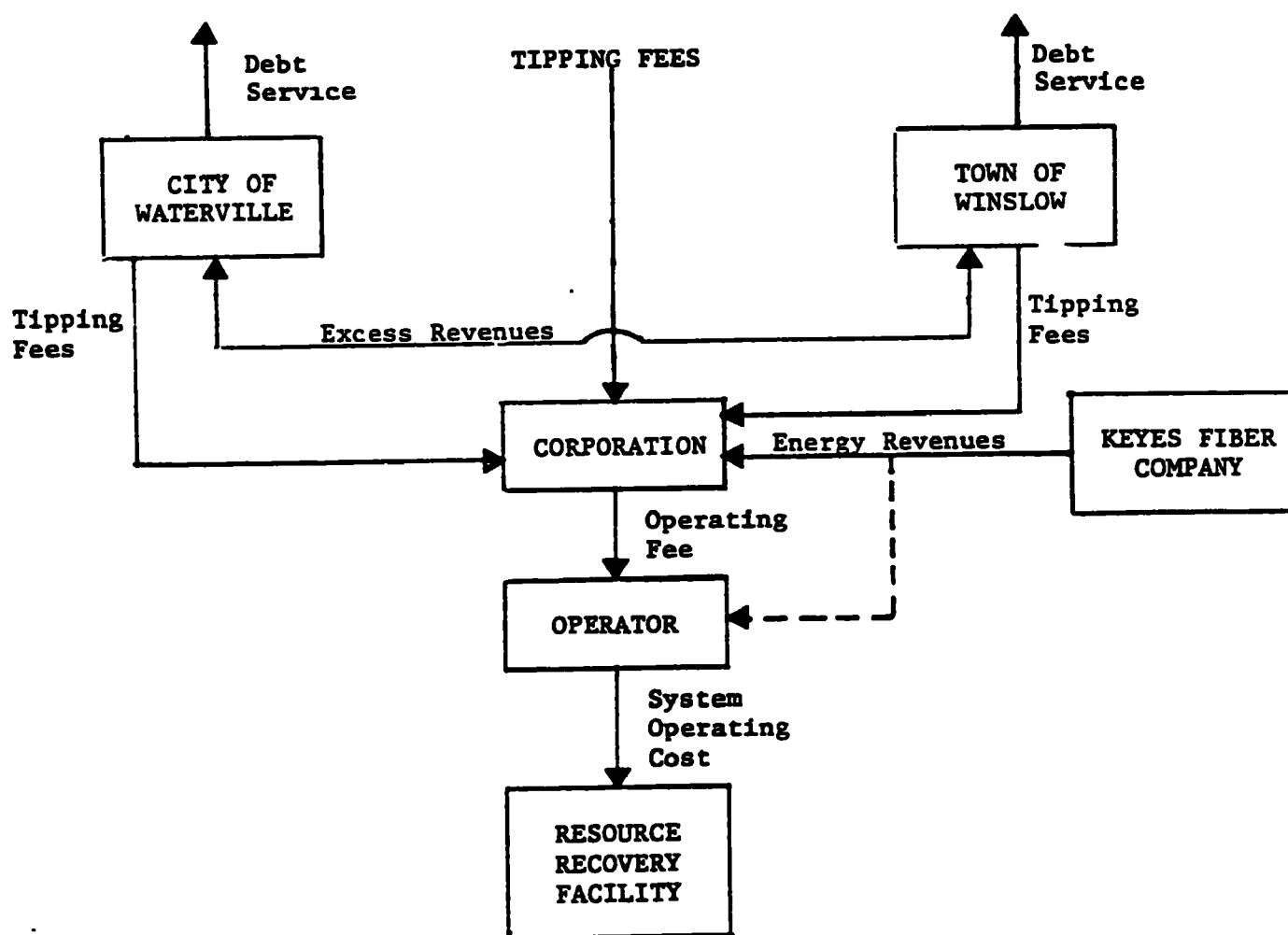


FIGURE 5.7: CASH FLOW FOR FACILITY OPERATED BY A PRIVATE CONTRACTOR



## VI. CONCLUSION

This study is designed to move Waterville/Winslow closer to actual implementation of a resource recovery facility. However, completion of this report is only part of the resource recovery planning and procurement process.

That process is generally divided into three phases:

- Phase I - Feasibility Analysis;
- Phase II - Procurement Planning; and
- Phase III - System Procurement.

The report by E.C. Jordan essentially completed Phase I, establishing the feasibility of energy recovery with Keyes Fibre Co. as the market for steam. The purpose in providing assistance through the Panels Program was to assist Waterville/Winslow in completing or making progress on the tasks in Phase II which include:

- define project;
- update project economics;
- secure waste supply;
- allocate risks;
- select procurement approach; and
- select financing approach.

This report has provided Waterville/Winslow with more detailed analysis of three important areas of the proposed project: the energy market and steam agreement, project economics and alternative procurement strategies. From these analyses, Gordian can make the following observations:

- the project under consideration is basically sound;
- the creation of the Corporation provides a vehicle for procurement and project management;
- an interested market for energy has been identified although there is considerable interest in seeking a new, possibly more secure, market; and

- the economics of the proposed project are promising - although the present landfill is inexpensive, it will reach capacity in the near future and means of developing a new landfill are foreseen - thus, resource recovery must be considered a viable alternative.

However, despite these promising factors, Gordian must caution Waterville/Winslow that some important elements of the project need to be addressed. These are:

- finalizing a contract for an energy market;
- securing contracts for waste supply; and
- a commitment from the community to raise the money for procurement.

In conclusion, Gordian recommends that Waterville/Winslow proceed with the steps outlined above and in Section V as quickly as possible. Any delay will result in increased costs for the system due to inflation as well as the loss of the momentum and commitments already gained.

**APPENDIX 1**

**WATERVILLE-WINSLOW INTERLOCAL SOLID WASTE AGREEMENT  
AND  
WATERVILLE-WINSLOW JOINT SOLID WASTE DISPOSAL FACILITY CORPORATION  
CERTIFICATE OF ORGANIZATION OF A CORPORATION AND BY-LAWS**

WATERVILLE-WINSLOW INTERLOCAL SOLID WASTE AGREEMENT  
AND  
WATERVILLE-WINSLOW JOINT SOLID WASTE DISPOSAL FACILITY CORPORATION  
CERTIFICATE OF ORGANIZATION OF A CORPORATION AND BY-LAWS

This AGREEMENT, made this                      day of  
1980, by and between the City of Waterville and the Town  
of Winslow, the participating municipalities hereinafter  
referred to as the "Parties," all being bodies politic and  
corporate located in the County of Kennebec, and State of  
Maine.

WHEREAS the Parties to this Agreement have the duty to  
provide solid waste disposal facilities for domestic and  
commercial solid wastes generated within their respective  
territories, pursuant to Title 38 M.R.S.A., section 1305(1);  
and

WHEREAS the Parties to this Agreement have determined  
that it will be a more efficient use of their powers and to  
their mutual advantage to enter into this Agreement; and

WHEREAS the Parties are authorized to contract pursuant  
to the Maine Interlocal Cooperation Act, pursuant to Title  
30, Chapter 203, M.R.S.A.; and

WHEREAS the Parties are desirous to cooperate with each  
other through an interlocal agreement to exercise jointly  
such powers, privileges, or authority as they are permitted  
by law to exercise individually in order to participate in  
a cooperative program for the management of solid waste  
generated within their boundaries and to thereby participate  
in an Energy Recovery Facility; and

WHEREAS the Parties to this Agreement are further desirous of setting forth herein the terms and conditions of their Agreement to cooperate in a program for the management of solid waste generated within their boundaries and an Energy Recovery Facility, and in addition to organize the Waterville-Winslow Joint Solid Waste Disposal Facility Corporation, hereinafter referred to as the "Corporation," to carry out such management duties and responsibilities and to set forth herein the Certificate of Organization and By-Laws of such Corporation; and

WHEREAS this Corporation shall be a quasi-municipal corporation, jointly owned by the City of Waterville and the Town of Winslow, and supported by public funds of the municipal Parties and by revenues produced and/or received from other users by contract with the Corporation.

NOW, THEREFORE, the municipalities of Waterville and Winslow, for and in consideration of the mutual promises and agreements hereinafter stated and the performance thereof do hereby promise and agree as follows:

#### PART 1. PURPOSE

1.1 That the purpose of this Agreement and the Corporation is to include but not be limited to providing for the disposal of solid wastes generated within the territories of the Parties, or within the territories of other individuals, corporations, or municipalities which may in the future become parties to this Agreement or which may contract with these Parties to this Agreement for the use of such participating municipal Parties' Solid Waste Disposal Facilities; and to organize, operate, and maintain thereby a joint Energy Recovery Facility; and for all purposes permitted under Title 13, Chapter 81, M.R.S.A., Corporations Without Capital Stock.

1.2 That the purpose of this Agreement is to provide for the acquisition of real and personal property necessary to the management of solid waste and to establish and carry out a program of solid waste management and an Energy Recovery Facility for solid waste:



- a. The management of such solid waste as may be generated within the boundaries of the Parties at rate schedules and proportions established pursuant to this Agreement; or
- b. As may be generated elsewhere when the management of such solid waste is accepted by a majority vote of the Waterville-Winslow Joint Solid Waste Disposal Facility Corporation, hereinafter referred to as the "Corporation," at rates established by the Board of Directors of the Corporation, hereinafter referred to as the "Joint Board."

## PART 2. DEFINITIONS

### 2.1 Definitions as used in this Agreement:

- a. "Solid Waste" means solid materials with insufficient liquid content to be free flowing, including without limitation rubbish, garbage, scrap materials, junk, refuse, inert material and landscape refuse.
- b. "Solid Waste Disposal Facility" means any land area or structure or combination of land area and structures, used for storing, salvaging, processing, reducing, incinerating, or disposing of solid wastes, including an Energy Recovery Facility for the incineration of solid waste and generation of steam for sale and revenue.

## PART 3. ADMINISTRATION

3.1 Joint Board. The Certificate of Organization and By-Laws of the Waterville-Winslow Joint Solid Waste Disposal Facility Corporation, attached to this Agreement as Appendix A and Appendix B respectively, are hereby incorporated into and made a part of this Agreement. The Joint Board of the

Corporation shall be two (2) members of each of the Parties' respective City and Town Councils duly appointed pursuant to each of the Parties' municipal charters and Maine law regarding appointments, plus each of the Parties' City Administrator and Town Manager, plus one (1) citizen-at-large for each ten thousand (10,000) in population for each of the respective Parties. Therefore, at the commencement of this Agreement and of this Corporation, and as according to each of the respective Parties' populations, the Municipality of Waterville shall have four (4) Joint Board members, and the Municipality of Winslow shall have three (3) Joint Board members. All terms of Joint Board members who are City or Town Council members and the City Administrator and Town Manager shall be co-terminous with municipal office and shall hold such position as a Joint Board member only during each of their present terms of office. Each and every citizen-at-large duly appointed by each of the respective City or Town Councils of each of the Parties to this Agreement, shall be so appointed for alternating staggered three (3) year and two (2) year terms.

Upon the effective date of this Agreement and of the Corporation, or as soon thereafter as possible, the Joint Board shall hold an organizational meeting to elect Officers of the Joint Board including a Chairman and Vice-Chairman, who shall perform the duties of the Chairman in his absence, along with such other Officers as may be deemed necessary or convenient, including but not limited to a Secretary and a Treasurer, and perform all actions necessary to incorporation pursuant to Title 13, Chapter 81, M.R.S.A., including the adoption of rules for the conduct of its meetings and its affairs. Officers of the Joint Board shall serve for a term of one (1) year.

The Joint Board is hereby established and created to conduct the cooperative undertaking contemplated by this Agreement, and to exercise on behalf of the participating municipalities the powers delegated to it.

Vacancies in the office of any of the members of the Joint Board shall be filled by appointment as according to the respective municipal charters of each of the Parties.

### 3.2 Meetings.

- a. Joint Board Meetings shall be called as pursuant to the By-Laws of the Waterville-Winslow Joint Solid Waste Disposal Facility Corporation, which By-Laws are attached hereto as Appendix B and made a part hereof.
- b. A quorum for any meeting shall consist of at least two-thirds (2/3's) of each of the Parties' representatives, and in order for a valid vote to be taken in order to do business, all actions must pass by a two-thirds (2/3's) vote of all members present; and if at any meeting there is only a minimum quorum present, then any vote taken on any action must be unanimous in order for such vote to be valid and for such action to pass and for the Joint Board to do business.

3.3 Powers. The Joint Board shall have all necessary, incidental, or convenient powers granted to Directors of non-capital stock corporations under Title 13, Chapter 81, M.R.S.A., subject to such limitations as are required by law and this Agreement, and including but not limited to the following powers and responsibilities, in order to accomplish the purposes stated herein and which are permitted by law to be exercised by the Parties respectively:

- a. On behalf of the participating municipal Parties, to purchase, lease as lessee, rent, hold, maintain, operate, lease as lessor, or convey any and all real and personal property or any easement or interest therein all as may be necessary, incidental, or convenient for its purposes. Ownership of any right, title, or interest therein shall be held by the Corporation unless some other arrangement is determined by the unanimous consent of the Joint Board to be more appropriate.
- b. To contract with any person, firm, corporation, or partnership, or other entity, private, public, governmental, or otherwise, for services, management, work, material, or property in the name of the Corporation.

- c. To adopt or alter rules and regulations and terms and conditions for the management of solid waste and for the administration, and operation and maintenance of the Corporation and its facilities.
- d. To employ or arrange for the employment of such persons as are required for the purposes stated herein.
- e. To receive and accept from, or contract with, the Federal, State, and Municipal governments, and other public or private agencies, for donations, loans, grants, or other assistance for solid waste management, and in any such contract agree to be bound by all applicable provisions of Federal, State, and Municipal statutes, ordinances, and regulations as the case may be.
- f. To make expenditures for and contract with respect to capital items from funds provided to the Corporation pursuant to this Agreement as stated herein.
- g. To contract with persons, corporations, districts, other municipalities, or other legal entities, both inside and outside the boundaries of the participating municipal Parties, and with the State of Maine, United States Government, and any agency of either, to provide for the management of solid waste at rates established by the Joint Board.
- h. To receive and disburse, on behalf of the participating municipal Parties, funds for any purpose contemplated by this Agreement.
- i. To license or grant permits to users of the Corporation's facilities on such terms as it deems proper.

- j. To adopt or alter rules and regulations, and terms and conditions regarding the types and amounts of various classifications of solid waste which may be disposed at the Corporation's facilities.
- k. To plan, construct, equip, operate and maintain a solid waste management program for the benefit of the municipal Parties, and any other parties by contract.
- l. To serve as a mutual forum to identify, discuss, study, and bring into focus the municipal Parties' solid waste problems and needs.
- m. To serve as a vehicle for the collection and exchange of solid waste information of concern and interest to the municipal Parties to this Agreement.
- n. To provide continuing organizational machinery to insure effective solid waste system operation, communication, and coordination, and cooperation among the municipal Parties to this Agreement.
- o. To foster, develop, and review policies, plans, and priorities for the Corporation.

#### PART 4. FINANCE

4.1 Costs of Capital and Operation Expenses, and Apportionment. Costs of acquisitions, improvements, and operations, and items incidental thereto, shall be paid for by fees collected from municipal commercial, and/or private users, grants, donations, and appropriations and the sale of steam and any salvagable materials from such solid waste disposal facility. Appropriations shall be allocated between the Parties in accordance with the following:

**Proposed**

Adjustment to page 8, item a.

- a. **Initial Capital Costs.** Each municipality shall furnish their respective dollar share of initial capital construction costs upon reasonable and timely demand by the Joint Board. Half of the initial capital cost will be shared by the two municipalities in proportion to their population and half in proportion to their respective municipal valuation.

- a. **Initial Capital Costs.** Each municipality shall furnish their respective dollar share of initial capital construction costs upon reasonable and timely demand by the Joint Board according to the ratio of one-half State municipal valuation and one-half population to one-half State municipal valuation and one-half population.
- b. **Subsequent Capital Expenses.** In the event that a capital expenditure is requested to be made, the cost of which in the opinion of the Joint Board is too great to be met from annual revenues during the fiscal year in which such capital expenditure is requested, the Joint Board shall notify the participating municipal Parties of the proposed capital expenditure.

In its notice to the participating municipal Parties, the Joint Board shall describe the project for which the capital expenditure is required, the estimated cost thereof, the term over which the cost shall be funded, the proportionate share of the estimated cost to be contributed by each participating municipal Party requested to provide such funds and the date or dates upon which such funds are to be made available to the Joint Board. Such capital funds may be provided by each participating municipal Party in such manner as it shall determine, from available revenue funds, by taxation, by borrowing, or otherwise. Each participating municipal Party shall promptly take such action as necessary to provide such capital funds and shall notify the Joint Board as soon as such funds are available. The notice to the Joint Board shall be accompanied by an opinion of counsel stating that the funds have been duly authorized and may properly be paid to the Joint Board or, if the funds are to be raised by borrowing, the notice to the Joint Board shall be accompanied by

preliminary opinion of recognized Bond Counsel indicating that by such a qualified opinion proving the legality of bonds or notes to be issued for said purpose can reasonably be expected at time such bonds or notes are issued and that the net proceeds may be properly paid to the Joint Board.

The funds so provided by the participating municipal Parties shall be used by the Joint Board for the purposes for which the request was made. Any surplus funds not so used shall be returned to the participating municipal Parties in the same proportion in which such Parties originally contributed such funds.

The proportionate share of the capital expenditures to be contributed by each participating municipal Party shall be determined by the Joint Board on the basis of the percentage of solid waste processed from such participating municipal Party on the average during the past preceding years not to exceed four (4) years.

- c. Apportionment of Debt Retirement. The City of Waterville and the Town of Winslow, being the municipal Parties to this Agreement, shall both raise their proportionate share of the initial capital investment for the construction of a Solid Waste Disposal Facility, and for any subsequent capital investment pursuant to the above section 4.1(b). Each such municipal Party shall be responsible for the retirement of its debt.

On an annual basis, however, there shall be a proportionate adjustment of capital debt to one of the municipal Parties, based upon the percentage of the previous year's actual usage by each municipal Party. The basis



for computing the annual debt retirement cost of each municipal Party shall be the original cost of the facility, and the cost of any subsequent capital investments, together with all debt retirement expenses, with equal annual reduction amounts over a twenty (20) year period to each municipal Party. When a municipal Party's usage increases or decreases from the original proportionate share, based upon the percentage of the previous year's actual usage by each municipal Party, the difference shall be paid to the Corporation with the other municipal Party's proportionate annual contributing share of operating cost to the Corporation increasing or decreasing in accordance with the adjusted amount.

- d. **Short Term Borrowing.** The Corporation shall only have the power to borrow by executing notes on a short term temporary basis and for cash-flow purposes only, and the term for which such notes shall become fully due and payable shall not exceed one (1) year, and which notes cumulatively in any one (1) fiscal year shall not exceed eighty percent (80%) of the previous year's operating budget, and which notes shall be paid out of income revenues during the fiscal year in which they were made.
- e. **Allocation of Costs of Operation.** Allocation of all costs of operation of the solid waste management program to the participating municipal Parties shall be accomplished on the basis of the percentage of solid waste generated by the Parties, and as otherwise herein provided, by charging each of the participating municipal Parties a uniform unit cost per ton of solid waste, which shall be so established each year by the Joint Board as, to the extent possible, will assure sufficient income to meet the cost of solid waste management for the ensuing year. Such

annual operating expenses shall also include unfunded capital outlay, if any, insurance, taxes, rentals, and necessary reserves for contingencies as determined by the Joint Board but not to exceed in any year five percent (5%) of the total operating budget. After the first fiscal year of operation has been completed, said uniform unit costs shall be computed on the basis of those amounts of solid wastes processed by each Party during the preceding year with adjustments made, if any, to each Party for the next estimated year of uniform unit costs.

Following the first full fiscal year of operation, said uniform unit costs shall be computed based upon actual amounts of solid wastes processed from each participating municipal Party in the preceding year as determined from Joint Board records with and including adjustments to each municipal Party for actual waste disposed in the preceding year. The Joint Board may require advance payment of such operating costs for the first fiscal year of operation.

4.2 Distribution of Revenues. Any excess revenues at the end of any fiscal year over and above what is needed to operate the Facility shall be disbursed back to each municipal Party as according to each Party's actual waste disposed at the Facility in the preceding year.

4.3 In-Kind Contributions. Subject to approval by the Joint Board, credit shall be given to the Parties for in-kind contributions to the Corporation.

#### 4.4 Financial Procedures.

- a. Budget. The Joint Board shall prepare a budget, establish user fees, determine recommended shares of costs, and transmit the same to the Parties at least 90 days

prior to the beginning of each Party's - fiscal year; and which calculations shall also include an itemized estimate of the expenditures and the anticipated revenues for the following year, all of which calculations, estimates, and reports shall be submitted upon completion to the respective City and Town Councils of the participating municipal Parties. Such itemized estimates of expenditures and anticipated revenues for the following year shall include the following:

1. **Anticipated Revenues.** An itemized estimate of anticipated revenues during the ensuing fiscal year from each source.
2. **Estimate of Expenditure.** An itemized estimate of expenditures for each classification for such ensuing fiscal year. Expenditures will include estimated operating expenditures and the actual amount of debt retirement, principal and interest, scheduled for each municipal Party to this Agreement for money they have borrowed for the joint Solid Waste Disposal Facility in accordance with sections 4.1(a) or 4.1(b).
3. **Actual Receipts.** After the first year of operation, an itemized statement of all actual receipts from all sources to and including June 30 of each previous fiscal year.
4. **Actual Expenditures.** After the first year of operation, an itemized statement of all actual expenditures to and including June 30 of each previous fiscal year.

5. **Estimated Cost Per Ton.** The estimated uniform unit cost per ton of solid waste to be charged for the ensuing fiscal year.

On or before March 1 of each year, the Joint Board shall adopt a final budget for the upcoming fiscal year which shall be itemized in the same manner as the estimate of expenditures and revenues. The budget shall include the amount of any deficit or anticipated deficit for the current year's operation. Such budget shall be submitted forthwith to the respective participating municipal Party's City and Town Councils and shall include an allocation of the annual costs of operation, the determination of which shall be pursuant to the section herein at 4.1(c) regarding Costs of Operation. Each participating municipal Party shall pay not later than the fifteenth (15th) day of July of each year an amount of money which shall equal the estimated unit cost per ton set forth in said budget multiplied by the number of tons of waste material delivered by and on behalf of such participating municipal Party to the Corporation's solid waste disposal facilities in the preceding month as determined by the Joint Board, but in no event shall such monthly payment be less than one-twelfth (1/12th) of the allocated share of such participating municipal Party for said ensuing fiscal year.

- b. **Fiscal Year.** The fiscal year shall be from July 1 to June 30 each year. The Parties shall make twelve (12) payments to the Corporation, with the first payment due on July 15 of each year.
- c. **Audit.** The Joint Board shall engage a qualified public accountant to conduct an annual audit of the Corporation's accounts. The audit shall be conducted on the basis of auditing standards and procedures prescribed by the State Auditor for municipalities.

## PART 5. PROPERTY

5.1 Title. The Corporation shall hold title to all real and personal property and any leasehold interests acquired pursuant to the purposes for which it is formed, subject to the following:

- a. In the event a site for any facility is acquired through exercise of the power of eminent domain by any one of the Parties, then the Party so taking shall retain title to the property taken and shall lease or donate the use of such property to the Corporation. The term of any such lease shall be the term of this Agreement or the useful life of the site as a solid waste disposal facility, whichever shall first occur. The Lessor Party may elect to receive in-kind contribution credit for the costs of acquisition. If the Lessor Party does not so elect, the other Party may pay amounts which in sum equal the cost of the taking less the Lessor Party's proportionate share, such payments shared in accordance with the Apportionment sections hereinabove, or such other method as the Parties shall agree to.

5.2 Improvements. The Corporation shall develop and construct all improvements, keep the same in good repair, and shall insure all properties acquired by or leased to it.

5.3 Distribution of Assets and Liabilities. Any Assets and/or Liabilities of the Corporation remaining at the time of termination of this Agreement shall be divided among the Parties according to their proportionate payments or contributions to the Corporation during the final five (5) years of this Agreement, subject to the following:

- a. Upon termination of this Agreement, all property, real and personal, acquired by the Corporation shall be offered for sale to the Parties at the market value of such property. Property not purchased by the Parties shall be sold at public auction.

- b. Upon termination of any lease under section 5.1(a) hereinabove, the other Party shall retain a claim against the owner municipal Party for a share of the proceeds of any resale of such land or, should the owner municipal Party elect to retain the land for other public uses, it shall have two (2) years to pay the other Party for its interests in the land.
- c. The right, title and interest of the participating municipal Parties in solid waste disposal sites when exhausted of their capacity and of no further use in the accomplishment of the purposes set forth herein shall be conveyed at no charge to that participating municipal Party within whose boundaries said site is located unless such participating municipal Party does not desire same.

#### PART 6. PERSONNEL.

6.1 Employment Status. The Joint Board may employ such persons as it deems necessary to accomplish the purposes of this Agreement. Any such employees shall be employees of the Corporation and shall not be deemed to be employees or subject to procedures, supervision, or rules of any Party. The Corporation shall be solely liable to any such employees for any liability for compensation or indemnity for injury or sickness arising out of or in the course of their employment.

- a. Staff time may be contributed to the Corporation by the Parties. Persons performing work under such contribution arrangements shall be under the supervision of the Joint Board or its designated supervisory personnel, but shall otherwise retain the status of an employee of the contributing Party.

6.2 Salaries and Benefits. The Joint Board shall have the power to fix compensation and to determine any benefits for its employees, provided, however, that such compensation and/or benefits are not substantially at variance with the compensation and/or benefits of employees of the Parties who perform similar duties.

6.3 Rules. The Joint Board shall establish rules and regulations to govern its employees in the performance of their duties, which rules and regulations may include job descriptions and grievance procedures.

#### 6.4 Hiring and Termination Procedures.

- a. The Joint Board shall cause advertisements to be placed in local publications for a period not less than fifteen (15) days prior to application deadlines for any position created or opened. Applicants shall provide such references and other information as the Joint Board may require. Applications shall be considered without regard to race, color, creed, national origin, political affiliation, sex or age over 18. Applicants shall possess such qualifications as the Joint Board shall establish.
- b. Termination of employment shall be for good cause and shall follow notice and opportunity for hearing.

### PART 7. REMEDIES

7.1 Breach. A Party shall be deemed to be in breach of this Agreement if it fails to appropriate or make timely payment of its share of costs, or if it fails to perform or comply with any of the terms, provisions, or conditions of this Agreement or of the By-Laws of the Corporation. The Joint Board shall give a Party written notice of specific acts or omissions which constitute breach. The Party so

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notified shall have thirty (30) days to conform. If the Party fails to conform within the above-mentioned time period, or if the Party waives the time period, then this Agreement shall be deemed rescinded, revoked, or otherwise discharged and dissolved and the above-mentioned section regarding Distribution of Assets shall apply along with each section of this Part 7.

7.2 Withdrawal and/or Breach. Any Party which breaches this Agreement or which may withdraw from this Agreement shall be subject to the following:

- a. A participating municipal Party may withdraw from this Agreement at the end of any fiscal year of the Corporation provided that it has given the Joint Board at least one (1) year's written notice of its intention to do so. The withdrawing Party shall make any payments due during such period.
- b. In the event the withdrawing Party fails to comply with subsection a. above, it shall pay to the Corporation an amount equal to its share of costs due through the following Corporation fiscal year.
- c. The withdrawing and/or breaching Party shall convey to the Corporation sufficient right, title, or interest in the property held by the Corporation to insure unfettered use for the purposes stated herein by the remaining municipal Party until the solid waste disposal site's or sites' capacity(ies) is exhausted and of no further use in the accomplishment of the purposes set forth herein, and after which time the assets of the Corporation at such site or sites formerly shared by the Parties pursuant to this Agreement shall be distributed pursuant to the above-section regarding Distribution of Assets at section 5.3. Furthermore, the



withdrawing and/or breaching Party shall have no vested right to continue to make use of any existing solid waste disposal site or sites or facilities of the Corporation.

- d. The withdrawing and/or breaching Party shall pay to the Corporation the entire amount of its share of any outstanding debts of the Corporation and of any lease payments due to any person, firm, corporation, or other legal entity leasing a solid waste disposal facility site to the Corporation, or any payments due under any other lease.

7.4 Corporation is Third-Party Beneficiary. The Corporation is hereby declared to be a third-party beneficiary of this Agreement and shall be entitled to seek enforcement of any term, provision, or condition of this Agreement.

7.5 Indemnification in Case of Liability to Third Parties. The Parties agree to indemnify each other for any liability which a Party or Parties may incur as a result of a suit against the Corporation arising out of activities performed by it for the benefit of the Parties. Any such indemnification shall be shared in accordance with the apportionment provisions as above-stated, or such other method as the Parties shall agree to.

#### PART 8. ADOPTION, AMENDMENT

8.1 Duration. This Agreement shall remain in full force and effect until either of the following occurs:

- a. One of the Parties withdraws from this Agreement or is in substantial breach thereof, or the Corporation is dissolved;
- b. For a term of forty (40) years from its effective date.

This Agreement may be extended by mutual agreement of the participating municipal Parties, evidenced by a duly executed instrument in writing attached hereto.

**8.2 Adoption.** This Agreement shall not take effect with respect to parties signatory unless the following occurs:

- a. It has been approved by the legislative bodies or the respective City and Town Councils of the Parties pursuant to their respective municipal charters, and a majority of the municipal officers thereof have affixed their signatures below; and
- b. It has been approved by the Attorney General and the Maine Department of Environmental Protection; and
- c. It has been filed with the clerk of each of the Parties, and with the Secretary of State.

**8.3 Review by Regional Planning Commission.** This Agreement shall be filed for review with the North Kennebec Regional Planning Commission at least thirty (30) days prior to the date of legislative or City or Town Council action by any of the Parties.

**8.4 Amendment.** This Agreement may be modified or amended by the Parties in the same manner as that provided in section 8.2 hereinabove. Other municipalities not original signatories hereof which wish to become participating municipalities as parties to this Agreement may be admitted to this Agreement if the Joint Board votes to admit such additional party, and the legislative body or the respective City and Town Councils of the Parties signatory hereof accepts by appropriate action such an additional municipality, upon that additional municipality's legislative body's or its municipal officer's duly approved acceptance by appropriate action under and pursuant to its municipal charter, and upon the terms and conditions placed upon such entry pursuant to this Agreement and any such further or other terms, conditions, as the Joint Board and/or the Parties hereto may require.

IN WITNESS WHEREOF, the various municipalities, Parties to this Agreement, have caused this Agreement to be executed and signed in their corporate names by their respective and duly authorized Officers, the day and year first above written.

CITY OF WATERVILLE

TOWN OF WINSLOW

BY _____	BY _____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Approved:

Attorney General \_\_\_\_\_

Maine Department of \_\_\_\_\_  
Environmental Protection

Regional Planning \_\_\_\_\_  
Commission

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A P P E N D I X A

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# Certificate of Organization of a Corporation, under Title 13, Chapter 81 of the Revised Statutes, and Amendments thereto.

The undersigned, incorporators of a corporation duly organized at Waterville City Hall Building .....  
in the town of Waterville ..... State of Maine, on the ..... day of .....  
A. D. 19 80... hereby certify as follows:

The name of said corporation is Waterville-Winslow Joint Solid Waste Disposal Facility Corporation

The purposes of said corporation are not for profit but are to promote the general social welfare of the participating municipal Parties, and for all purposes permitted by law, including but not limited to providing for the disposal of solid wastes generated within the territories of the participating municipal Parties to the Waterville-Winslow Interlocal Solid Waste Agreement, which agreement is attached hereto and made a part hereof; and for providing for the disposal of solid wastes generated within the territories of other individuals, corporations, or municipalities which may become parties to such Agreement or which may contract with the participating municipal Parties to such Agreement for the use of such Corporation's solid waste disposal facilities; and to organize, operate and maintain thereby a joint Energy Recovery Facility; and for all purposes permitted under Title 13, Chapter 81, M.R.S.A., Corporations Without Capital Stock; and to do all things which are reasonable to carry out and perpetuate all of such purposes, including but not limited to holding or acquiring, improving, operating, selling, conveying, assigning, mortgaging, or leasing any real or personal property, and borrowing money and executing such evidence of indebtedness and such contracts, agreements, and instruments as authorized by such Waterville-Winslow Joint Solid Waste Agreement and Corporation By-Laws attached hereto and made a part hereof, and to execute and deliver any mortgage, deed of trust, assignment of income, or other security instrument in connection therewith, hiring personnel, contracting with other legal entities, and all of such other purposes, powers, and things necessary or appropriate or convenient for carrying out and exercising all of such foregoing purposes and powers as stated hereby, or stated or authorized or implicit in the Waterville-Winslow Interlocal Solid Waste Agreement and the Corporation By-Laws attached hereto and made a part hereof.

This Corporation shall be a quasi-municipal corporation, jointly owned by the City of Waterville and the Town of Winslow, and supported by public funds of the municipal Parties and by revenues produced and/or received from other users by contract with the Corporation.

The regulation of the internal affairs of the Corporation, and distribution of assets on dissolution or final liquidation shall be as according to the Waterville-Winslow Interlocal Solid Waste Agreement, and the Waterville-Winslow Joint Solid Waste Disposal Facility Corporation By-Laws, both of which are attached hereto and made a part hereof.

The name and place of address of each of the incorporators are as follows:

Paul R. LaVerdiere, Mayor  
City Hall Building  
Common Street  
Waterville, Maine 04901

David Blair  
Chairman of Winslow Town Council  
Goodridge Lane  
Winslow, Maine 04902

Robert W. Palmer, Jr.  
Waterville City Administrator  
City Hall Building  
Common Street - Waterville, Me. 04901

Edward A. Gagnon  
Winslow Town Manager  
Winslow Municipal Building  
16 Benton Avenue - Winslow, Me. 04902

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A P P E N D I X B

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ARTICLE I

Office.

Section 1.01. Principal Officer.

The principal office of the Corporation in the State of Maine shall be located at Waterville, County of Kennebec.

Section 1.02. Registered Office and Agent.

The Corporation shall have and continuously maintain in the State of Maine a registered office and a registered agent whose office is identical with such registered office.

ARTICLE II

Board of Directors.

Section 2.01. General Powers.

The affairs of the Corporation shall be managed by its Board of Directors known as the "Joint Board."

Section 2.02. Number, Tenure, and Qualifications.

The Board of Directors of the Corporation, known as the Joint Board, shall be two (2) members of each of the Waterville-Winslow Interlocal Solid Waste Agreement party municipality's respective City and Town Councils duly appointed pursuant to each of such party municipality's charters regarding appointments, plus each of such party municipality's City Administrator and Town Manager, plus one (1) citizen-at-large for each ten thousand (10,000) in population for each of the respective party municipalities and which citizen-at-large to be duly appointed by the respective City or Town Council. Therefore, at the commencement of this Corporation, and as according to each of the respective party municipality's populations, the municipality of Waterville shall have four (4) members of the Joint Board and the municipality of Winslow shall have three (3) members of the Joint Board. All terms of members of the Joint Board who are City or Town Council members and the City Administrator and Town Manager shall be co-terminous with municipal office and shall hold such position as a member of the Joint Board only during each of their present terms of office. Each and every citizen-at-large duly appointed by each of the respective City or Town Councils of each of the party municipalities shall be so appointed for alternating staggered three (3) year and two (2) year terms.

### Section 2.03. Organizational Meeting and Regular Meetings.

Upon the effective date of this Corporation, or as soon thereafter as possible, the Board of Directors, being the Joint Board, shall hold an Organizational Meeting, elect a Chairman and Vice-Chairman who shall perform the duties of the Chairman in his absence, along with such other officers as may be deemed necessary or convenient, including but not limited to a Secretary and Treasurer, and perform all actions necessary to incorporation pursuant to Title 13-B, M.R.S.A., including the adoption of rules for the conduct of its meetings and its affairs.

A regular annual meeting of the Joint Board shall be held, without other notice than these By-Laws, on the \_\_\_\_\_ day of \_\_\_\_\_ at the City of Waterville Council Chambers. The Joint Board may provide by resolution and without other notice than such resolution, the time and place for holding additional regular meetings of the Joint Board.

### Section 2.04. Special Meetings.

Special meetings of the Joint Board may be called by or at the request of the Chairman, or shall be called by the Secretary at the request of any two (2) members of the Joint Board. The authorized person or persons calling a special meeting of the Joint Board may fix the time and the place of such Special Meeting unless by resolution the Joint Board has deemed otherwise.

### Section 2.05. Notice.

Notice of any Special Meeting of the Joint Board shall be given at least two (2) days previously thereto by written notice delivered personally, or four (4) days notice sent by mail or telegram, to each member of the Joint Board at his address as shown by the records of the Corporation. If mailed, such notice shall be deemed to be delivered when deposited in the United States Mail in a sealed envelope so addressed, with postage thereon prepaid. If notice be given by telegram, such notice shall be deemed to be delivered when the telegram is delivered to the telegraph company. Any member of the Joint Board may waive notice of any meeting. The attendance of a member of the Joint Board at any meeting shall constitute a waiver of notice of such meeting, except where a member of the Joint Board attends a meeting for the express purpose of objecting to the transaction of any business because the meeting is not lawfully or properly called or convened. The business to be transacted at the meeting need not be specified in the notice or waiver of notice of such meeting, unless specifically required by law or these By-Laws.

### Section 2.06. Quorum.

A Quorum for any meeting shall consist of at least two-thirds (2/3's) of each of the delegation of representative members to the Joint Board of each of the municipalities, respectively, which are parties to the "Waterville-Winslow Interlocal Solid Waste Agreement."



## Section 2.07. Manner of Acting.

In order for a valid vote to be taken in order to do business all actions must pass by a two-thirds ( $2/3$ 's) vote of all members of the Joint Board present; and if at any meeting there is only a minimum Quorum present, then any vote taken on any matter must be unanimous in order for such vote to be valid and for such action to pass and for the Joint Board to do business.

## Section 2.08. Vacancies.

Vacancies in the office of any of the members of the Joint Board shall be filled by appointment as according to the respective municipal charters of each of the municipalities which are parties to the Waterville-Winslow Interlocal Solid Waste Agreement. A member of the Joint Board appointed to fill a vacancy shall be so appointed for the unexpired term of his predecessor in office.

## Section 2.09. Compensation.

Members of the Joint Board shall not receive any compensation for their services as directors.

## Section 2.10. Absence from Meetings.

Any member of the Joint Board who is absent from three (3) consecutive meetings without excuse satisfactory to the Joint Board shall be deemed to have surrendered his office as a member of the Joint Board.

## Section 2.11. Residuary Powers.

The Joint Board shall have the powers and duties necessary or appropriate for the administration of the affairs of the Corporation, and including but not limited to the powers granted to the Joint Board by the Waterville-Winslow Interlocal Solid Waste Agreement, except those specifically granted or reserved by law, the Certificate of Organization, these By-Laws, or the Waterville-Winslow Interlocal Solid Waste Agreement.

## Section 2.12. Removal From Office.

A member of the Joint Board may be removed from office, for cause, by vote of not less than three-fourths ( $3/4$ 's) of the members of the Joint Board present, unless there is a minimum Quorum present whereby a unanimous vote shall be required as according to Section 2.07 above, and provided in any case that notice of such proposed action shall have been duly given in the notice of the meeting and provided the member of the Joint Board has been informed in writing of the charges preferred against him at least ten (10) days before such meeting; such charges preferred against any such member of the Joint Board may be brought by any member or members of the Joint Board. The member of the Joint Board involved shall be given an opportunity to be heard at such meeting.

ARTICLE IIIOfficers.

## Section 3.01. Officers.

The Officers of the Corporation shall be members of the Joint Board and shall include a Chairman, a Vice-Chairman who shall perform the duties of the Chairman in his absence, a Secretary, and a Treasurer, along with such other Officers as may be deemed necessary or convenient; such Officers to have the authority of and perform the duties prescribed, from time to time, by the Joint Board. The Officers of Secretary and Treasurer may be combined and held by one person.

## Section 3.02. Election and Term of Office.

The Officers of the Corporation specified in Section 3.01 shall be elected from the membership of the Joint Board by the Joint Board at its annual meeting or as soon thereafter as possible. New Officers may be created and filled at any meeting of the Joint Board. Each Officer shall hold office until the next annual meeting and until his successor shall have been duly elected and shall have qualified. A Chairman of the Joint Board shall not serve more than three (3) consecutive terms of office.

Election of Officers shall be by written ballot cast by qualified members of the Joint Board and as according to those number of votes necessary by Sections 2.06 and 2.07 above.

## Section 3.03. Removal.

Any Officer elected by the Joint Board may be removed by the Joint Board by vote of not less than three-fourths (3/4's) of the members of the Joint Board present, unless there is a minimum Quorum present whereby a unanimous vote shall be required as according to Section 2.07 above, whenever in its judgment the best interests of the Corporation would be served thereby; but such removal shall be without prejudice to such person in his or her capacity as a member of the Joint Board.

## Section 3.04. Vacancies.

A vacancy in any Office because of death, resignation, removal, disqualification, or otherwise, may be filled by the Joint Board for the unexpired portion of the term by the same procedure used to elect the original Officer.

## Section 3.05. Chairman.

The Chairman shall be the principal executive officer of the Corporation and shall in general supervise and control all the business and affairs of the Corporation. He shall preside at all meetings of the members and of the Joint Board. He may sign, with

attestation of or along with the Secretary or any other proper Officer of the Corporation authorized by the Joint Board, or without any such attestation or co-signature if so directed by the Joint Board, any deeds, mortgages, bonds, contracts, or other instruments which the Joint Board authorizes to be executed, except in cases where the signing and execution thereof shall be expressly delegated by the Joint Board or these By-Laws or statute to some other Officer or agent of the Corporation; and in general he shall perform all duties incident to the office of Chairman and such other duties as may be prescribed by the Joint Board from time to time.

#### Section 3.06. Vice Chairman.

In the absence of the Chairman or in the event of his inability or refusal to act, the Vice Chairman shall perform the duties of the Chairman, and, when so acting, shall have all powers of and be subject to all the restrictions upon the Chairman. Any Vice Chairman shall perform such other duties as from time to time may be assigned to him by the Chairman or the Joint Board.

#### Section 3.07. Treasurer.

The Treasurer shall give a bond for the faithful discharge of his duties in such sum and with such surety or sureties as the Joint Board shall determine. He shall have charge and custody of and be responsible for all funds and securities of the Corporation; receive and give receipts for moneys due and payable to the Corporation from any source whatsoever; deposit or invest all such moneys in the name of the Corporation in such banks, trust companies, or other depositories, or in such notes or bonds as shall be selected in accordance with the provisions of Article VI of these By-Laws; and in general perform all duties incident to the office of Treasurer and such other duties as from time to time assigned to him by the Chairman or the Joint Board.

#### Section 3.08. Secretary.

The Secretary shall keep the minutes of the meetings of the Joint Board in one or more books provided for that purpose; see that all notices are duly given in accordance with the provisions of these By-Laws or as required by law; be custodian of and see that the Seal of the Corporation, if any, is fixed to all documents the execution of which on behalf of the Corporation under its seal is duly authorized and required, if at all, in accordance with the provisions of these By-Laws, by law, or by the Joint Board; and, in general, perform all duties incident to the office of Secretary and such other duties as from time to time may be assigned by the Chairman or the Joint Board.

#### Section 3.09. Executive Manager

If at any time the Joint Board deems it necessary or convenient, it may appoint an Executive Manager as the day-to-day supervisor and administrator of the Corporation, and who shall be responsible to the

Joint Board, and whose duties shall be those as prescribed by the Joint Board, and who shall be chosen and appointed by the Joint Board on the basis of his executive and administrative qualifications with special reference to his actual experience in, or his knowledge of, the duties and purposes of such Corporation. Any person appointed to fill the position of Executive Director, or any vacancy therein, shall have such term as the Joint Board fixes, but no member of the Joint Board shall be eligible to this position of executive director except as a temporary appointee.

#### Section 3.10. Additional Personnel.

The Joint Board may from time to time employ such personnel as it deems necessary or convenient to administer or assist in administering the Corporation. The selection and compensation and duties of such personnel shall be as determined by the Joint Board.

### ARTICLE IV

#### Order of Business.

##### Section 4.01. Order of Business.

The order of business at any regular annual or special meeting of the Joint Board shall be:

- (a) Reading and approval of any unapproved minutes.
- (b) Reports of Officers and Committees.
- (c) Unfinished business.
- (d) New business.
- (3) Adjournment.

##### Section 4.02. Parliamentary Procedure.

On questions of parliamentary procedure not covered in these By-Laws, a ruling by the Chairman shall prevail.

### ARTICLE V

#### Committees.

##### Section 4.01. Committees.

Committees not having and exercising the authority of the Joint Board as specifically prescribed to the Joint Board by the Waterville-Winslow Interlocal Solid Waste Agreement, by law, or by these By-Laws, may be designated by a resolution adopted by the Joint Board. Except as otherwise provided in such resolution, members of each such Committee shall be members of the Joint Board, and/or citizens-at-large who are residents of either municipality which is a party to the Waterville-

Winslow Interlocal Solid Waste Agreement, and/or municipal officers or officials of any such party municipality to such Interlocal Agreement. Any member of any such Committee may be removed by the Joint Board whenever in its judgment the best interests of the Corporation shall be served by such removal, but any such removal of any Committee member who is also a member of the Joint Board shall be without prejudice to such person in his or her capacity as a member of the Joint Board.

#### Section 5.02. Term of Office.

Each member of a Committee shall continue as such until the next regular annual meeting of the Joint Board and until his successor is appointed, unless the Committee shall be sooner terminated by the Joint Board, or unless the Committee is extended for a longer period of time by resolution of the Joint Board, or unless such member of a Committee is removed from such Committee, or unless such member shall cease to qualify as a member of any such Committee.

#### Section 5.03. Chairman.

One member of each Committee shall be appointed Chairman by the Joint Board.

#### Section 5.04. Vacancies.

Vacancies in the membership of any Committee may be filled by appointments made in the same manner as provided in the case of the original appointments of members to such Committee, by the Joint Board for the unexpired portion of the term.

#### Section 5.05. Quorum.

Unless otherwise provided in the resolution of the Joint Board designating a Committee, a majority of the whole Committee shall constitute a Quorum and the act of a majority of the members present at a meeting at which a Quorum is present shall be the act of the Committee.

#### Section 5.06. Rules.

Each committee may adopt rules for its own government not inconsistent with these By-Laws or with rules adopted by the Joint Board.

### ARTICLE VI

#### Contracts, Checks, Deposits, and Funds.

##### Section 6.01. Contracts.

The Joint Board may authorize any Officer or Officers, agent or agents of the Corporation, in addition to the Officers so authorized by these By-Laws, to enter into any contract or execute and deliver any instrument in the name of and on behalf of the Corporation; and such authority may be general or confined to a specific instance.

### Section 6.02. Checks, Drafts, etc.

All checks, drafts, orders for the payment of money, notes, bonds, or other evidences of indebtedness or investment issued in the name of the Corporation shall be signed by such Officer or Officers, agent or agents of the Corporation, and in such manner as shall from time to time be determined by resolution of the Joint Board or as specifically prescribed by the Waterville-Windlow Interlocal Solid Waste Agreement, by law, or by these By-Laws. In the absence of such determination by the Joint Board, such instruments shall be signed by the Treasurer and countersigned by the Chairman of the Joint Board.

### Section 6.03. Deposits.

All funds of the Corporation shall be deposited to the credit of the Corporation in such banks, trust companies, or other depositories, or in such notes or bonds as the Joint Board may select. Any investments in any notes and/or bonds of corporate moneys may be made, from time to time, only with such corporate moneys as are not immediately necessary to operate or maintain the Corporation, and any such moneys invested may only be invested in reasonable and prudent notes and/or bonds in a fiduciary manner.

### Section 6.04. Gifts.

The Joint Board may accept on behalf of the Corporation any contribution, gift, bequest, or devise for the general purposes or for any special purposes of the Corporation.

## ARTICLE VII

### Books and Records.

The Corporation shall keep correct and complete books and records of account and shall also keep minutes of the proceedings of the Joint Board and any of its Committees and sub-Committees, and shall keep at the registered or principal office a record giving the names and addresses of all members of the Joint Board and of its committees and sub-Committees and agents and employees. All books and records of the Corporation may be inspected by any member of the general public or his agent or attorney, for any proper purposes at any reasonable time. The Joint Board shall cause an audit of the records of the Corporation to be made each year by a competent auditor.

## ARTICLE VIII

### Fiscal Year.

The fiscal year of the Corporation shall begin on the first (1st) day of July and end on the last day of June in each year, unless changed or amended by resolution of the Joint Board.

ARTICLE IXSeal.

The Joint Board may provide a Corporate Seal, which shall be in the form of a circle and shall have inscribed thereon the name of the Corporation and the words, "Corporate Seal."

ARTICLE XWaiver of Notice.

Whenever any notice is required to be given under the provisions of the Laws of the State of Maine or the Certificate of Organization or these By-Laws of the Corporation, a waiver thereof in writing signed by the person or persons entitled thereto, whether before or after the time stated therein, shall be deemed equivalent to the giving of such notice. The attendance of any person at a meeting or place stated in any such notice, or the doing of any act as notified in any such notice shall constitute a waiver of notice except where any such person attends a meeting or is present at an act for the express purpose of objecting to any such meeting, act, or doing of business because such was not properly called or convened.

ARTICLE XIRepeal or Amendment of By-Laws.

These By-Laws may, from time to time, be altered, amended, repealed, or re-made and adopted by the members of the Joint Board at any regular annual meeting, or at any special meeting of the Joint Board called for such purpose, provided, however, that no such action shall change the purposes of the Corporation so as to impair its rights and powers under the Laws of the State of Maine, or to waive any requirement of bond or any provision for the safety and security of the property and funds of the Corporation or to deprive any member of the Joint Board or any municipality which is a party to the Waterville-Winslow Interlocal Solid Waste Agreement, without their express assent, of rights, privileges, or immunities then existing. Notice of any making, adoption, altering, amendment, or repeal of these By-Laws to be offered at any meeting of the Joint Board shall be given not less than seven (7) nor more than thirty (30) days before such meeting and shall set forth such alteration, amendment, or repeal of such By-Laws.

KNOW ALL MEN BY THESE PRESENTS: that the undersigned Secretary of the Corporation identified in the foregoing By-Laws does hereby certify that the foregoing By-Laws were duly adopted by the incorporators and Joint Board of said Corporation, as By-Laws of said Corporation, on the \_\_\_\_\_ day of \_\_\_\_\_, 1980, at a duly called and constituted meeting, and that they do now constitute the By-Laws of said Corporation.

(Corporate Seal)

-9-

Secretary

## **APPENDIX 2**

### **MAJOR REOURCE RECOVERY RISK AREAS AND GENERAL EXAMPLES**



The following section has been excerpted from the publication, Resource Recovery Plant Implementation Guides for Municipal Officials Risks and Contracts, compiled for the U.S. Environmental Protection Agency, Office of Solid Waste, by Robert E. Randol in 1976. It has been modified by Gordian to further clarify examples of risks. It serves as a useful guide in understanding the relevant areas of risk in resource recovery project implementation.

# 1. Risk Areas Affecting Waste Supply

<u>Risk Area</u>	<u>Examples</u>
Waste Composition	New laws or consumer behavior can alter the composition of the waste. Changes in the composition of the waste stream, in turn, can: (1) lower the fraction or quality of combustibles or recoverable materials and thereby reduce the revenue potential per ton of input; or (2) increase the unprocessable wastes to be landfilled and, thus, increase the net cost of operations.
Waste Quantity	New laws affecting consumer behavior can cause seasonal or permanent reductions in the quantity, which, in turn, will result in: (1) increased costs to process each ton of waste (because of fixed cost associated with facilities and equipment); and (2) decreased total annual revenues and, therefore, return on fixed investment.
Jurisdiction Withdrawal	If a jurisdiction decides to discontinue delivery of waste to a recovery facility, all the consequences of a waste quantity change, plus the possibility of discontinuing recovery operations, are felt by other participants in recovery operations. Generally, no public legislative body may bind future legislative bodies to continue to participate in a project (i.e., regional system).
Competition from Processing Alternative	Resource recovery is undergoing significant technological change. If a new competing processing alternative is implemented and attracts some of the waste that could have been processed by the recovery facility, then the consequences are the same as those for a waste quantity change.

## 2. Risk Areas Affecting Markets

<u>Risk Area</u>	<u>Examples</u>
Competing Materials Prices	Reductions in the price of primary fuels and/or secondary materials may drive down the prices for the recovered fuels and materials, thus, reducing project revenues. If these reductions force the project into a period of economic frustration, operations may have to be discontinued.
Substitutability of Recovered Product	Due to changes in production processes, recovered fuels and/or materials may in the future be less substitutable for primary fuels and materials. Although most trends are <u>toward</u> recovered materials, some are not (notably power generation where the overall trend is toward nuclear plants). The more likely event is that the specifications required of recovered fuels and materials by buyers could exceed a recovery facility's ability to produce. In either event, the revenues of the recovery project could be reduced and some of the output may have to be landfilled.
User Incremental Costs	Buyers of recovered materials or fuels may have to make unanticipated investments in order to use them, or their operating costs may increase as a result of their use. These cost impacts may be reflected in the price that the user is willing to pay for the products - or in demands on the recovery project for user-based investment - thus affecting the recovery project's cost and/or revenues.
Shipment Size and Frequency Requirements	Most producers require that raw material shipments be scheduled over regular intervals and sized according to their production schedules. Deviations from these requirements by suppliers can cause production problems. If a recovery project cannot consistently meet the delivery requirements of its buyers, then its marketing contracts may be cancelled. This would affect project revenues and could put the project in jeopardy.
User Specifications	Requirements by users of recovered fuels or materials for consistent quality could affect: (1) the operating cost of the recovery project; (2) the price paid by buyers per unit of output; or (3) the duration of the contract between the project and the buyer. In the extreme case of inability to meet specifications, the project may find its marketing contracts cancelled.

<u>Risk Area</u>	<u>Examples</u>
User Location	A change in the locations of one or more buyers of recovered materials or fuel could affect the net price (net of transportation costs) per unit of output and, in the extreme case, the ability of the recovery project to service the buyer. In either event, the revenues of the project would be affected.
User's Financial Condition	If the buyer of recovered fuel or materials goes out of business or is unable to pay for deliveries, the project's revenues will be correspondingly diminished.
Legislation and Regulations	Changes in freight rates and rate structures could result in higher transportation costs (and, possibly, lower net revenues) or in cost discrimination against a recovered fuel or material. Either event could affect both the demand for and the price of recovered materials and fuel.
Contract Duration	Marketing contracts may elapse before the investment in the recovery facilities is recovered. This could place the project in a precarious position should the operator be unable to renew the contract or find new buyers.

### 3. Risk Areas Affecting Facility Construction

<u>Risk Area</u>	<u>Examples</u>
Delays	Delays in the completion of construction and in the start-up date can cause cost overruns in the project and necessitate the continued use of obsolete or undesirable disposal methods. Delays also result in an inability to deliver the anticipated output of the recovery plant to customers.
Contract Suspension	Suspension of a construction contract has the same consequences as construction delays.
Increased Capital Costs	Increases in the cost of equipment or materials during the facility construction phase can cause the cost to process each ton of waste to increase as a result of the increased fixed cost. If these increases are large enough, the entire project may be jeopardized if additional financing cannot be secured.
Site Availability	If it proves difficult to find and acquire a facility site that is environmentally suited to recovery operations: (1) the project may be delayed; (2) the cost of operating may be increased, especially if the site is distant from the source of waste and/or the buyers of output; or (3) the project may be jeopardized.

#### 4. Risk Areas Affecting Facility Operation

<u>Risk Area</u>	<u>Examples</u>
System Reliability	Since solid waste cannot be stored for more than a short period, excessive downtime for the recovery system may result in foregone revenues from material or fuels that otherwise would have been recovered and sold. Likewise, inferior quality of recovered materials could result in lower prices per unit and, therefore, reduce revenues. Either event could lead to cancellation of contracts for purchase of outputs. Either event also could require temporary use of a less desirable means of waste disposal which would add to the total system cost. (NOTE: The solid waste must be disposed whether the system is operational or not.)
Economic Frustrations	Should the participants in the resource recovery project find it impossible to operate at a reasonable cost, the project may be jeopardized with the consequences of: (1) having to find alternative means for disposing of the waste; (2) discontinuing or revising whatever services relied upon the output of the recovery facility; and (3) satisfying debts to project financiers.
Inflation	Inflationary forces may increase operating costs faster than revenues are increasing, thus causing the project's net cost to increase. In addition, if <u>allowable</u> cost increases are tied to a national or state cost index and the index changes faster or slower than the actual costs, then one or more participants in the project may suffer economically.
Labor Productivity	Reductions in the productivity of labor may cause the operating cost of the project to increase or could result in an inability to process the targeted tonnage per day. The latter consequence would result in lower output of materials and reduced revenues.
Hazardous Wastes	Should explosive, radioactive, or chemically dangerous wastes find their way to the recovery facility, the health and safety of the project's labor force and the safety of the facility itself may be jeopardized. This could result in unscheduled downtime or even cancellation of operations. The consequences could include lost revenues, increased costs, interrupted production, and temporary use of alternative disposal methods.

<u>Risk Area</u>	<u>Examples</u>
Legislation and Regulations	Certain legislation, especially that which could affect waste quality (e.g., mandatory source separation), or facility design (e.g., pollution control standards), could result in decreased revenues or increased costs per ton of waste processed. In the extreme case of removing a large portion of the input to an individual subsystem of a resource recovery plant (such as the possible effect of beverage container deposit legislation on an aluminum recovery subsystem), the economic viability of that subsystem may be jeopardized.
Waste Stream Quantity and Composition	Discussed under "Waste Supply" risks.
Storage Capacity	If the storage capacity for incoming waste or outgoing materials is not sufficient to handle emergencies (such as shut-downs, storms, etc.), then waste may have to be diverted to alternative disposal. This could affect project costs and revenues.

## 5. Risk Areas Affecting Disposal

<u>Risk Area</u>	<u>Examples</u>
Site Capacity	The capacity of the disposal site for residuals from the recovery operation, and for unprocessable wastes, may run out before the end of facility operations, thus causing a need to find an emergency disposal site (probably at extra cost).
Legislation and Regulations	Regulations may be implemented which require design changes for landfills (e.g., liners to prevent ground water pollution). This would increase the cost of recovery system operations.
Site Location	A change in the location of the site for land-filling residuals could increase operating costs by requiring a longer haul from the recovery facility to the landfill.



**APPENDIX 3****PRICE SUPPORT LOANS FOR MUNICIPAL WASTE ENERGY PROJECTS**

## Price Support Loans for Municipal Waste Energy Projects

### Introduction

The Energy Security Act (ESA), which was signed by President Carter on July 2, 1980, contains several significant incentives for resource recovery projects including price support loans. The objective of this program is to encourage the development of alternate energy sources which will displace fossil fuels, particularly oil and natural gas. Through the price support loan program, the sale of energy from a resource recovery facility will be subsidized during the early years of the project when its economics might normally require a tipping fee which would make it unattractive in comparison to landfill disposal. In later years, when increased revenues from energy sales improve project economics, the price support loans are repaid.

### Price Support Loan Program

The amount of the price support to be disbursed to a resource recovery project will be determined as the standard support price (SSP) reduced by the cost of fuel displaced by waste derived energy, with a maximum allowable support of \$2.00 per MMBTUs. The SSP is defined as the world price of oil at the time of enactment of ESA, and will remain unchanged throughout the life of the program.

For a new resource recovery facility, price supports will be provided over a seven year period. The full price support will be provided for the first year, six-sevenths for the second year, five-sevenths for the third year, and so on until, in the seventh year, one-seventh of the price support is paid. (For existing projects, price supports loans will be provided for five years, with a similar reduction in support amount over that time period.)

In the year following the final disbursement (the eighth year for new facilities), the price supports will be repaid over the remaining planned life of the project (but not to exceed 15 years). The interest rate for the loan repayment will be determined following the final loan disbursement and will be based on the current average market yield

on outstanding marketable obligations of the United States plus not to exceed one per cent.

#### Standard Support Price

The standard support price (SSP) has been set at \$5.37 per MMBTUs in rules proposed by DOE (Federal Register, 9/25/80). If the fuel being displaced is No. 6 fuel oil or a higher grade petroleum product (as is the case with Keyes), the price support will be increased by 25% (to \$6.71 per MMBTUs).

#### Cost of Fuel Displaced

The amount of fuel displaced can be determined by the following equation:

$$\text{Amount of fuel displaced} = \frac{(\text{quantity of working fluid})}{.85} - (\text{quantity of fossil fuel used})$$

The working fluid is steam or hot water and when multiplied by the enthalpy of the steam, h (in BTU per lb) gives the energy contained in a given quantity of steam or hot water. Using a representative efficiency for a fossil fuel boiler (.85), an estimate of the fossil fuel energy that would have been needed to produce that quantity of steam/hot water is obtained. From this is subtracted the energy used as auxiliary fuel in the secondary combustion chamber.

The cost of this displaced fuel will be determined on a case-by-case basis from actual costs incurred during a base period of any 12 consecutive months during the 18 month period preceding any commitment on the part of DOE to make a price support loan to the project.

#### Effect on Project Economics

In order to illustrate the effect of price support loans on the economics of the Waterville/Winslow project, the probable amount of the

price support loans for Alternative A have been calculated. These calculations use the following assumptions:

MSW accepted by facility:	23,380 TPY
MSW processed by facility:	22,211 TPY
Steam produced per ton MSW:	5,800 lbs
Steam conditions:	125 psig, saturated
Enthalpy, h:	1,191 BTU/lb
Cost of displaced fuel:	\$4.96 per MMBTUs
(based on \$30.29 per barrel in 1981, at 6.11 MMBTUs/bbl)	
Auxiliary fuel use per ton MSW:	0.3 mm BTUs

The energy produced annually by the facility can be calculated:

$$22,211 \text{ TPY} \times 5,800 \text{ lb/ton} \times 1,191 \text{ BTU/lb} = 153,429 \text{ MMBTU}$$

Since the fuel displaced would be No. 6 fuel oil, the SSP can be calculated using \$6.71 per MMBTUs:

$$6.71 \times 153,429 = \$1,029,510$$

The amount of displaced fuel can be obtained using the following equation:

$$\begin{aligned} & \frac{(22,211 \times 5,800 \times 1191)}{.85} - (300,000 \times 22,211) \\ &= (180,500 - 6,663)(10^6) \\ &= 173,837 \text{ MMBTUs} \end{aligned}$$

Assuming that the cost of the displaced fuel is determined in 1981 at \$4.96 per MMBTUs, the cost of the displaced fuel is estimated at:

$173,837 \times 4.96 = \$862,231$  thus, the maximum amount of price support loan is found by subtraction

= SSP - displaced fuel cost  
 = 1,029,510 - 862,231  
 = \$167,270

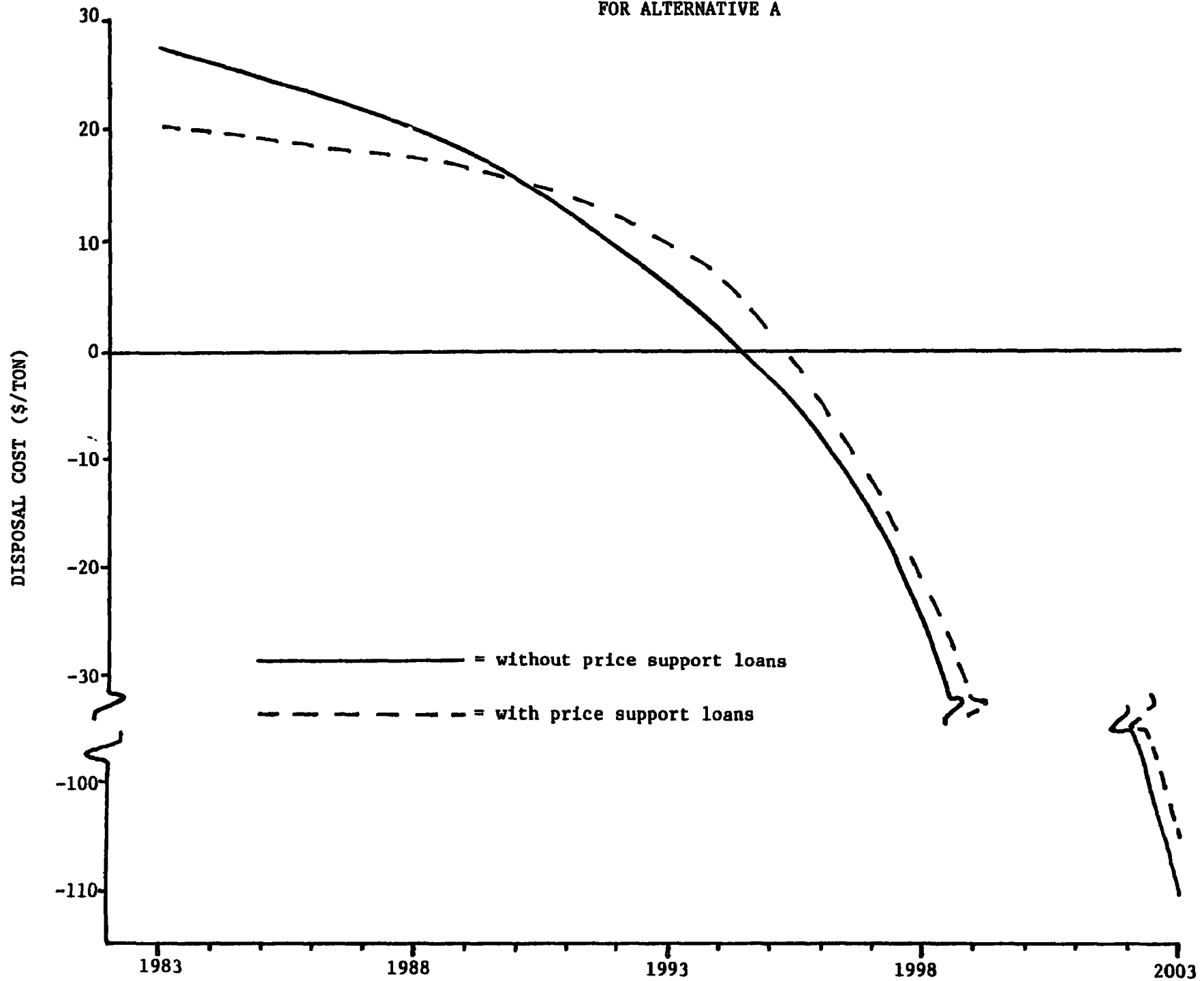
If the facility accepts 23,380 TPY of MSW, the price support loan amounts to \$7.15 per ton in the first year of the project.

The probable effect of price support loans on the proposed Waterville-Winslow project (Alternative A) is shown in Table III-1. A total of \$669,112 in price supports would be provided in the first year of the project (1983). The loan payback would begin in 1990 and continue for the remaining 13 year planned life. The interest rate assumed for this projection is 13%, based on an average 12% rate for treasure notes over the disbursement period plus one per cent.

The debt service for this would be \$109,300 per year which represents an additional cost of \$4.67 per ton in the remaining 13 years of the project.

The effect of price support loans on the disposal cost or effective tipping fee for Alternative A is shown in Figure III-1. This cost is significantly lower in the early years of the project with price support loans, but it does not decrease as rapidly in the middle years. However, due to the effect of increasing energy revenues on project economics, the facility would become profitable only one year later with price supports than without.

FIGURE III.1  
EFFECT OF PRICE SUPPORT LOANS ON DISPOSAL COSTS  
FOR ALTERNATIVE A



**APPENDIX 4****PRELIMINARY EVALUATIONS FOR THREE POTENTIAL SITES**

“



## **SCS ENGINEERS**

STEARNS, CONRAD AND SCHMIDT  
CONSULTING ENGINEERS, INC.

11800 SUNRISE VALLEY DRIVE  
RESTON VIRGINIA 22091  
(703) 620-3877

ROBERT P. STEARNS, PE  
E. T. CONRAD, PE  
CURTIS J. SCHMIDT, PE

MARK L. BRECHER, PE  
RODERICK A. CARR  
MILES J. HAVEN  
GARY L. MITCHELL, PE  
RONALD E. PERKINS, PE  
DAVID E. ROSS, PE  
DONALD M. SHILES, PE  
JOHN P. WOODYARD, PE

November 17, 1980  
File No. A0280-1

Mr. William H. Ranney  
Gordian Associates, Inc.  
1919 Pennsylvania Avenue, NW  
Washington, D.C. 20006

Subject: Waterville-Winslow, Maine, Phase II, Site Investigations, Prime Contract No. 68-01-4940 (68-01-60001)

Dear Bill:

This letter and attachments constitute our output for Task 3, Site Investigations, Amendment No. 6 to the Agreement between SCS and Gordian. Under this scope of work, SCS was to perform an investigation of three potential sites for the proposed resource recovery facility and to determine on a preliminary basis the differences between the sites.

The scope of this effort was as follows:

- Preparatory work such as reviewing the files and previous reports and developing a data form for collecting information.
- A one day site visit to see the sites and to collect the information that could be obtained within the time available.
- Limited follow-up telephone calls to obtain additional information.
- Compilation of the data and preparation of this submittal.

This report submittal consists of the following:

- A data form for each site. Most of the information that was obtained during the site visit is noted on it.
- A budgetary order-of-magnitude cost estimate for site development for each of the sites.



Mr. William H. Ranney  
Page two

It should be emphasized that these cost estimates are primarily for comparison and are intended only as a starting point. Additional effort is needed in order to more precisely define the work required in order to develop any of these sites. Also, these estimates reflect a conservative approach; i.e., some of these costs could likely be reduced by detailed investigation and engineering analysis. For example, we assumed at the Keyes No. 1 site that water would be brought in some 800 feet from College Avenue, including crossing of the railroad tracks, rather than estimating lower costs for unconventional means of providing water.

Further investigations and engineering should be authorized if this cost information is intended for more than comparative analysis between the sites. For example, if the costs would be used for contract negotiations with the user, more definitive data is needed. Furthermore, we recommend that further engineering input be provided to the Northern Kennebec Regional Planning Commission to help this project to proceed forward. Historically, this project has had a lack of engineering in comparison to the amount of planning and meeting etc. I perceive that if the project is allowed to continue to be drug out, the primary potential steam user will likely become impatient and develop alternative strategies for reducing their energy costs.

We welcomed this opportunity to provide these additional services to you and EPA and look forward to continuing to serve you all.

Very truly yours,



E. T. Conrad, PE  
Principal  
SCS ENGINEERS

ETC/sjb  
Enclosure

cc: Ron Perkins

PRELIMINARY SITE RECONNAISSANCE  
DATA FORM, KEYES #1

**SITE LOCATION**

- See vicinity maps, USGS 15 Minute Quadrangle, Waterville, 1959, Figure 1

City zoning map, Figure 2

- Distance to user - 300' to Keyes plant
  - Keyes to install steam line, including constructing it under railroad tracks

**TRANSPORTATION FACTORS**

- Vehicles hauling refuse to site - Estimated 25 packer loads per day
- Loads of residue - less than 6 per day
- Distance to major road and condition of major road
  - 0.55 miles to College Avenue, which is a 4-lane arterial road.
  - Exit off College Avenue is 0.5 north of Keyes' plant
  - When traveling north on College Avenue, an 160° turn must be made off of College Avenue.
  - When traveling south on College Avenue, a left turn of about 20° is required.
  - Trucks delivering refuse from Winslow can reach the turn off the College Avenue about as fast as by traveling north to the bridge at Fairfield and then traveling south on College Avenue, as they could by driving through Waterville and north on College Avenue. Thus, not all packer trucks delivering refuse would have to make the 160° turn off College Avenue.
  - If Fairfield and other towns to the north start delivering refuse to the facility, they will have an easy turn off College Avenue.
- Trucks (packers delivering refuse and trucks hauling residue can often exit by crossing railroad tracks 0.1 mile south of the site and travelling through Keyes' yard to College Avenue 0.4 miles away, when there are no railroad cars parked at the crossing. The railroad will not agree to keeping the tracks clear of trains.
- Access road to site

- 0.45 miles of 10' wide all-weather road exists. It should be widened/improved to 24' width and it would be desirable to pave the road. This road passes within 60' of 2 residences.
- 0.10 miles of paved, 20' to 35' wide public road exists. Although paved, it appears to have been paved and patched. I suspect that the base does not comply with current road building standards. This road passes 7 or 8 residences.

#### SITE DESCRIPTION

- Existing land uses

- Industrial zoning and use. Keyes plant was built in 1903 at this location.
- No known change is apparent.
- The proposed site is currently unused. It is separated from the plant by two tracks of the Maine Central Railroad.

- Size of potential site

260' x 120' ±

- Owner of site: Keyes Fibres, Inc.

Land to be leased

Assessed Land Value \$15,000 to \$17,000/acre of raw land

(Assessed Value = 0.93 x market value)

- Topography

- Gentle slope (less than 2%) from the plant to the bank of Kennebec River

- Two pole lines pass through the site. I think both lines have telephone and power cables. They will both probably have to be relocated.

- Appearance of site.

- Unused and unkept industrial land covered with wild grass.
- No planting required as screening.

- Drainage Requirements

- Existing conditions and problems. Generally drains to the river and the low area to the north.
- Required improvements - minimal.

- Soil Conditions
  - Sandy loam, 2,500 psf allowable bearing pressure
  - Use spread foundations
  - Water table is probably well below the site
  - The river is 30' below the site
- Site grading requirements - grade to provide drainage
- Potential for vandalism - minimal
  - Keyes tries to operate 24 hours per day, 365 days per year
  - Keyes has caretaker/guard to watch their facilities
  - No fencing required

#### UTILITIES

##### Water

- Purveyor - Kennebec Water District  
Waterville, ME  
Ted Rohman  
872-2763
- Location of nearest public lines
  - 12" line and private (Keyes) fire hydrants on College Avenue
  - Extension required - 800' + including passing under two railroad tracks (a casing would have to be jacked under the tracks and the pipeline jacked through the casing).
  - Connection charge - none
- Alternate water supplies
  - Fire protection line - connect to Keyes' fire protection line, which obtains its water from the river.
  - Ash quenching (process) water
    - Install an intake in the river and pump, or
    - Connect to the cooling water (for vacuum pumps) system that Keyes has if sufficient capacity exists. Install a meter. Crossing of the railroad tracks would probably be required.

- Potable water, connect to Keyes' potable water system in the plant and install a meter. Jack a casing under the railroad tracks.
- Keyes will provide treated make-up water for the boilers.
- Connection charge - no charge by Kennebec Water District.

### Sewer

- Owner - Kennebec Sanitary Treatment District  
Bill Cullem  
873-0611
- Waterville Sewerage District  
Waterville, ME  
Dave Blair  
872-2763
- Nearest line and size
  - 24" or 30" industrial interceptor, 100' west of site. It has adequate volumetric capacity.
  - Keyes also has a 24" RCP Industrial waste line, about 70' south of the site.
  - KSTD applies its sludge to land. Thus, it has stringent limitations on heavy metals. Pre-treatment would be required to remove heavy metals from ash quenching.
  - A volume measuring structure would be required.
  - A composite sampler would probably have to be installed.
  - Sanitary wastes can be discharged to the industrial interceptor.
- Connection charge - none.

### Electric Line

- Utility company - Central Maine Power Co.  
Waterville, ME  
Gordon McPhall  
873-4201
- Nearest line
  - Site is 150' from CMPC substation which reduces voltage to 12,470v. This substation serves Keyes. CMPC or resource recovery facility could build a line to the resource recovery facility and install a transformer at the facility to provide power. This would involve a significant capital cost which can probably be avoided.
  - The least cost extension would probably consist of extending a new line from College Avenue around the Keyes plant to the railroad facility, which would be about 800' long.

- Special problems in making connection. Two pole lines exist across the site. They may require relocation. This site needs further study; it is rather complicated.
- Connection charge - No extension charge anticipated. A pole line relocation charge of about \$3,000 might be required.

#### Telephone Line

- Utility Company - New England Telephone and Telegraph Co.  
Waterville, ME  
Peter Gorman  
947-9911 (Bangor office for new non-residential services)
- Nearest line
  - There are two lines across the site which may be usable.
  - Alternately a new line will have to be extended from College Avenue.
  - Additionally, Maine Central Railroad has a pole line on south side of tracks which might be usable for this purpose.
- Connection charge - \$3,000 estimated for extension and relocating pole lines.

#### OTHER ENVIRONMENTAL FACTORS/POTENTIAL PROBLEMS

##### Noise

- Should not be a problem, except trucks passing by 10 residences on the haul road north of Keyes.

##### Emissions

- Comply with State standards. Keyes would insist upon that too to ensure that DEP would not blame Keyes for problems that the resource recovery facility might cause.
- Refuse-contaminated drainage cannot drain to river. Containment facilities would be needed.

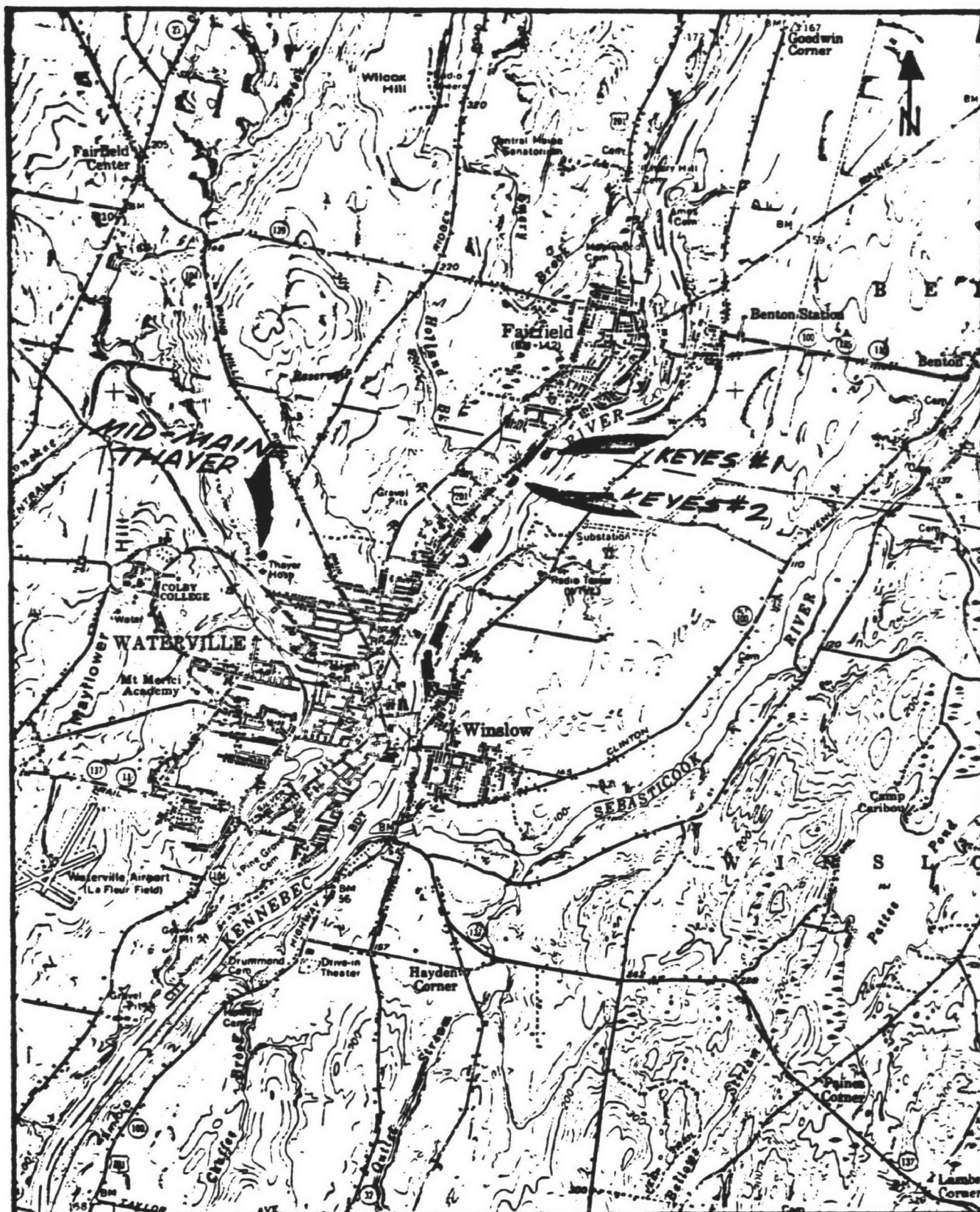
##### Nearby Residents/Landowners

- Trucks delivering refuse to the resource recovery facility must pass close by about 10 residences. That could be a major problem.

##### Wind Consideration - No problem.

Other

- Special exception permit required to locate within 250' of river.
- The line separating the Town of Fairfield and the City of Waterville passes through the Keyes plant, just north of the site. This is also the line that separates Somerset and Kennebec Counties.

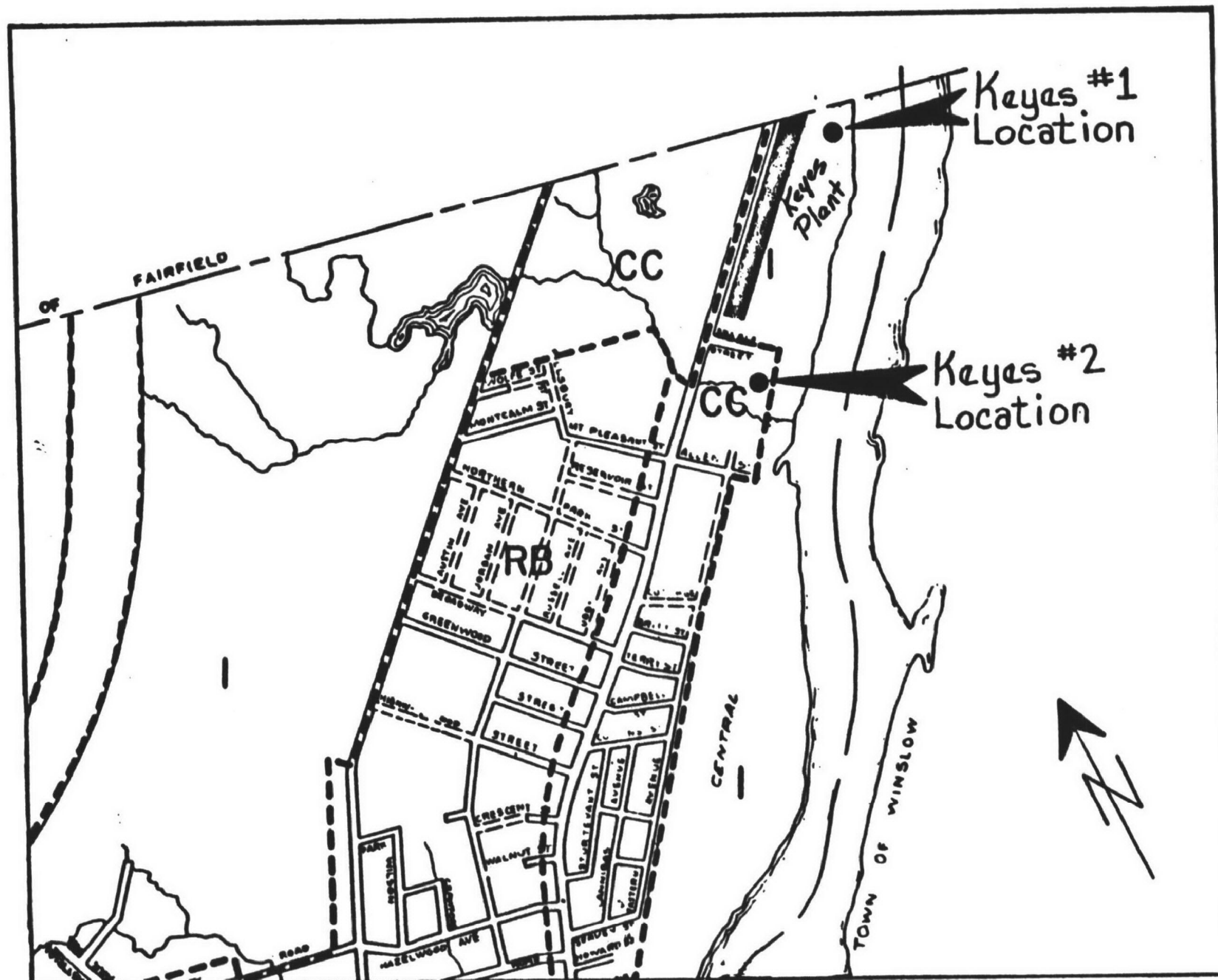


**Scale: 1"=2000'**

Source: USGC 15 min.  
Quad., Waterville, ME,  
1957

**Figure 1. VICINITY MAP**





Scale: 1"=1000'

Source: City of Waterville  
Zoning Map, 1979

Figure 2. LOCATION MAP PROPOSED RESOURCE RECOVERY FACILITY

PRELIMINARY COST ESTIMATE  
FOR SITE PREPARATION, KEYES #1

Land acquisition, Keyes to lease	NC
Clearing and grading	
· Clearing	\$ 500
Grading	500
Siltation Control	500
Access road	
Grading to widen road to 24', 2400' length	3,000
Drainage culverts, CUP, 150' @ \$14/LF	2,100
including end sections and daylighting	
6" crushed stone base @ \$5/ ton, 24' wide	
x 2400' long = 6,400 sy @ \$1.60/sy	10,200
3" asphalt paving @ \$16/ton, 12' wide x	
2400' long = 3,200 sy @ \$4.10/sy	13,100
Site Preparation	
Finished grading and 9" crushed stone base @ \$5/ton	
= 4000 sy @ \$2.30	9,200
3" asphalt paving @ \$16/ton	
= 2,500 sy @ \$4.10	10,300
Utilities	
<u>Water</u>	
6" pipe, 800' @ \$16/LF	12,800
Connection to existing line	2,000
Jack pipe under railroad tracks	8,000
Fire hydrant	1,000
<u>Sewer</u>	
6" lateral, 200' @ \$15/LF	3,000
1 manhole @ \$1,000	1,000
Composite sampler	2,000
Metering structure	5,000
<u>Electric Service</u>	
No charge for connection	
Pole line relocation	3,000
<u>Telephone Service</u>	
No charge for connection	
Pole line relocation	<u>3,000</u>

Subtotal	\$ 90,400
Contingencies and engineering, 25 percent	<u>22,600</u>
TOTAL	\$113,000

PRELIMINARY SITE RECONNAISSANCE  
DATA FORM, KEYES #2

SITE LOCATION

- See vicinity maps, USGS Quadrangle, Waterville, Figure 1  
Town Zoning Map, Figure 2
- Distance to user(s) - 3000 feet to main user
  - Keyes would build a steam line and reduce cost of steam accordingly

TRANSPORTATION FACTORS

- Vehicles hauling refuse to site
  - Estimated 25 packer loads per day.
- Loads of residue
  - Less than six truck loads per day.
- Distance to major road and conditions of major road
  - 250 feet to College Avenue which is a four-lane arterial road.
- Access road to site
  - Perble Street.
  - Patched up pavement without good definition of width.
  - For proposed truck traffic, repave with 1½ inch surface course.
- Land uses adjacent to access road
  - Commercial and industrial.

SITE DESCRIPTION

- Size of potential site
  - Gross size of parcel is 280'x215', but creek through it reduces useable acreage and fill for parking lot to the west appears to be on the parcel.

- Existing land uses

- Commercial (CC) zoning.
- Used car dealer between site and College Avenue with partially paved and paritally gravel-surfaced parking.
- Was formerly the site of the gas plant where gas was manufactured from coal.
- A large gas storage plant exists at the eastern edge of the site. It is currently used to store and distribute gas.
- It is assumed that the gas storage and distribution facilities will remain in service as is, and the proposed resource facility will use the remainder of the site. Maine gas will likely not agree to this "sharing" of the site. Also, sharing of the site will cause the site layout to be difficult and not as efficient as other sites.
- Land south of the site (across the creek) is low-level commercial development. Further south, 1/4 + mile from the site, is residential. The residences are gradually being replaced with industrial/commercial development.

- Topography

- Gently sloping, 3 percent +, except parking lot fill to the west which appears to be partially on this property. Railroad tracks to east are higher.

- Road

- 250 feet to public road.
- Condition of nearest public road: excellent
- Improve roadway to College Avenue, 250 feet long by 28 feet wide.

- Appearance of site

- Site is grass covered. Trees are on south side along the creek.
- Planting required as screening - None.

- Drainage Requirements

- Existing conditions and problems - A drainage ditch is at the east side of the site adjacent to and at the toe of the fill for the railroad tracks. A creek is on the south side of site.
- Required improvements - None.

- Soil conditions
  - up to 5 feet of fill on site.
  - probably sandy loam, like at Keyes, with 2500 psf allowable bearing pressure.
  - use spread footings.
- Site grading requirements
  - Remove uncompacted fill and recompact.
  - Remove fill on west side of parcel if additional space is needed.
- Potential for vandalism
  - Accessible from College Avenue.
  - Install a 6 foot chainlink fence with barbed-wire guard.

## UTILITIES

### Water

- Purveyor - Kennebec Water District  
Waterville, Maine  
Ted Rohman  
872-2673
- Location of nearest lines and sizes (map)
  - 20 inch line crosses site, 20 feet east of west property line.
  - Fire hydrants exist on College Avenue, 300 feet ± from site.
  - 100+ psi static pressure.
- Extension requirements - Nominal
- Connection charge - No charge

### Sanitary Sewer

- Owner - Waterville Sewerage District  
Waterville, Maine  
Dave Blair  
873-5191
- Nearest lines and sizes
  - 30 inch industrial intercept<sup>or</sup> on riverside of CMRR tracks. It would be expensive to jack a sewer under the tracks. It could be possibly routed on the surface through the culvert under the railroad tracks. A 200-300 foot lateral would be required.

- 10 inch sewer on the south bank of the brook south of the site. A pump station and force main or an inverted siphon would be required to connect to this line. A 200-300 foot lateral would be required.

- Special requirements - Same as for Keyes #1 site.
- Connection charge - None

#### Electric Line

- Utility company - Central Maine Power Company  
Waterville, Maine  
Gordon McPhail  
873-4201
- Nearest line
  - Transformers are on a pole on north side of site. Power lines are also on College Drive.
- Any special problems in making connection - none anticipated
- Connection charge - none expected

#### Telephone Line

- Utility company - New England Telephone and Telegraph Company  
Waterville, Maine  
Peter Gorman  
947-9911 (Bangor office for new non-residential services)
- Nearest line
  - On College Avenue; also appears to be a telephone line on the north side of the site.
- Connection charge - Less than \$100

#### OTHER ENVIRONMENTAL FACTORS/POTENTIAL PROBLEMS

Noise - No apparent problems.

Emissions - Must comply with State standards

Nearby Residents/Landowners - None within 1/4 mile of site.

Wind Consideration

- West winds are prevalent
- Commercial land uses are immediately to the south and residences are about 1/4 mile to the south of the site.
- To the east is the river; on other side of river (1/4 mile away) is industrial property.

Other

- A special exception permit is required for facilities located within 250 feet of the river.

Conclusion - I did not see any reason why there would be any serious objections to use of this site for an incinerator and steam generation facility.



PRELIMINARY COST ESTIMATE  
FOR SITE PREPARATION, KEYES #12

Land acquisition, 1 acres @ \$25,000 (if available at all)	\$ 25,000
Maingas storage and distribution facility to remain where it is	
Clearing and grading	
Clearing	500
Excavation of loose fill and recompaction.	8,000
Additional grading	
Retaining wall on west side of property	6,000
Siltation control	500
Access/Road	
Drainage devices	1,800
1½" asphalt resurfacing @ \$16/ton, 28' wide x 250' long = 800 sy @ \$3.00/sy	2,400
Site Preparation	
Finished grading and 9" crushed stone base @ \$5/ton = 4000 sy @ \$2.30/sy	9,200
3" asphalt paving @ \$16/ton = 2,500 sy @ \$4.10/sy	10,300
Grade and pave area for Maingas facility	15,000
6' chainlink fence with guard, 800' @ \$9.00/LF	7,200
Utilities	
<u>Water</u> - Connection and fire hydrant	4,000
<u>Sewer</u>	
4" force main, 200' @ \$20/LF	4,000
Pump Station and metering device	15,300
Composite sampler	2,000
<u>Electric Service</u>	NC
<u>Telephone Service</u>	NC
Subtotal	\$111,200
Contingencies and engineers, 25 percent	<u>27,800</u>
TOTAL	\$139,000

PRELIMINARY SITE RECONNAISSANCE  
DATA FORM - THAYER CAMPUS  
MID-MAINE MEDICAL CENTER

**SITE-LOCATION**

- See vicinity maps, USGS 15 Minute Quadrangle, Waterville, 1959, Figure 1
- City zoning map, Figure 3
- Distance to user(s) - 700 feet + to Thayer boiler
    - Unknown to other users; more than 1/4 mile

**TRANSPORTATION FACTORS**

- Vehicles hauling refuse to site - estimated 25 packer loads per day
- Loads of residue - less than six per day
- Distance to major road and condition of roads
  - The Thayer campus is on North Avenue, a major two-lane arterial that is in good condition. It is heavily traveled. Packer use of this road should be no problem.
  - To reach site, turn north off North Street onto Quarry Road and travel about 0.15 miles. Quarry Road is a residential type street that is in good condition; Quarry Road is lightly traveled.
  - At corner of North Avenue and Quarry Road is a small school. Beyond that are woods to the turnoff of the site. Another 0.1 miles beyond the turnoff is a home for the mentally retarded, and 0.1 to 0.2 miles beyond that is an apartment complex. The truck traffic to the facility should not be a major problem.
  - The Mid-Maine staff and their architect stated that the 25 to 30 trucks traveling to the facility would not be a problem for the hospital.
  - The access road to the resource recovery facility could be located on an undeveloped right-of-way for about 500 feet; another 200 feet of road on Mid-Maine property would have to be built. All of this road would be in heavily wooded land that is undulating.
  - It is doubtful that Mid-Maine would allow packer trucks to gain access to the resource recovery facility through its parking lot, although that would be less costly to construct.

## SITE DESCRIPTION

- Existing land use
  - Institutional zoning where the resource recovery facility would be located.
  - A moderate to high income residential area exists about 1/4 + mile to the west.
  - A shopping center exists to the northwest.
- Future land uses
  - Not expected to change significantly in the general area.
  - This area appears to be growing slowly.
- Size of potential site - several acres. This is no problem
- Owner of site - Mid-Maine Medical Center
- Land value - Assessed value is \$700 per acre, undeveloped  
Assessed value is reportedly 93 percent of market value
- Topography
  - Site, variable slopes up to 10 percent.
  - Access road - Variable up to 20 percent, including crossing small swales.
- Road - 700 feet to Quarry Road
- Appearance of site
  - Heavily wooded deciduous trees. Would provide excellent screening.
- Drainage Requirements
  - No foreseeable problems.
  - Drain to the swale.
  - Minimal downstream problems.
  - Culverts required for access road where it would cross swales.

- Soil Conditions per SCS map
  - Classification is  $\frac{65}{C-2}$  silt and clayey.
  - 8-15 percent slopes.
  - Well drained.
- Foundation Problems
  - Use spread foundations.
- Site grading requirements
  - Considerable clearing.
  - Fair amount of grading.
- Potential for vandalism
  - Thought to be relatively low.
  - Apartments to the northwest and high to moderate income housing to the east, both  $1/4 \pm$  mile away.
- Fencing Requirements
  - Six foot chainlink fencing around site.

## UTILITIES

### Water

- Purveyor - Kennebec Water District  
Waterville, Maine  
Ted Rohman, Superintendent  
872-2763
- Location of nearest lines and sizes
  - 20 inch line on Quarry Road.
- Extension requirements
  - 700 foot extension plus a fire hydrant at site.
- Connection Charge - None

### Sanitary Sewer

- Owner - Waterville Sewer District  
Waterville, Maine  
Dave Blair  
827-2763

- Nearest line and sizes

- 8 inch or 10 inch sewer in Quarry Road (700 feet away via the proposed access road or immediately adjacent to the Thayer parking lot).
- 15 inch interceptor between North Street and the river (1000 feet away via a route immediately adjacent to the Thayer parking lot).

- Special requirements

- Same as for Keyes #1 site.

- Connection charge

- None.

### Electric Line

- Utility company - Central Maine Power Company  
Waterville, Maine  
Gordon McPhail  
873-4201

- Nearest line

- Three Phase line on North Street, near Eustis Parkway.
- No special problems in making connection. Extend an overhead line along North Street to beyond Thayer Unit and north outside parking lot to the resource recovery facility.

- Connection charge

- Probably no charge. Demand should warrant no-cost extension.

### Telephone Line

- Utility Company - New England Telephone and Telegraph Company  
Waterville, Maine  
Peter Gorman  
947-9911 (Bangor office for new non-residential services)

- Nearest line

- On North Avenue and on Quarry Road.

- Connection charge

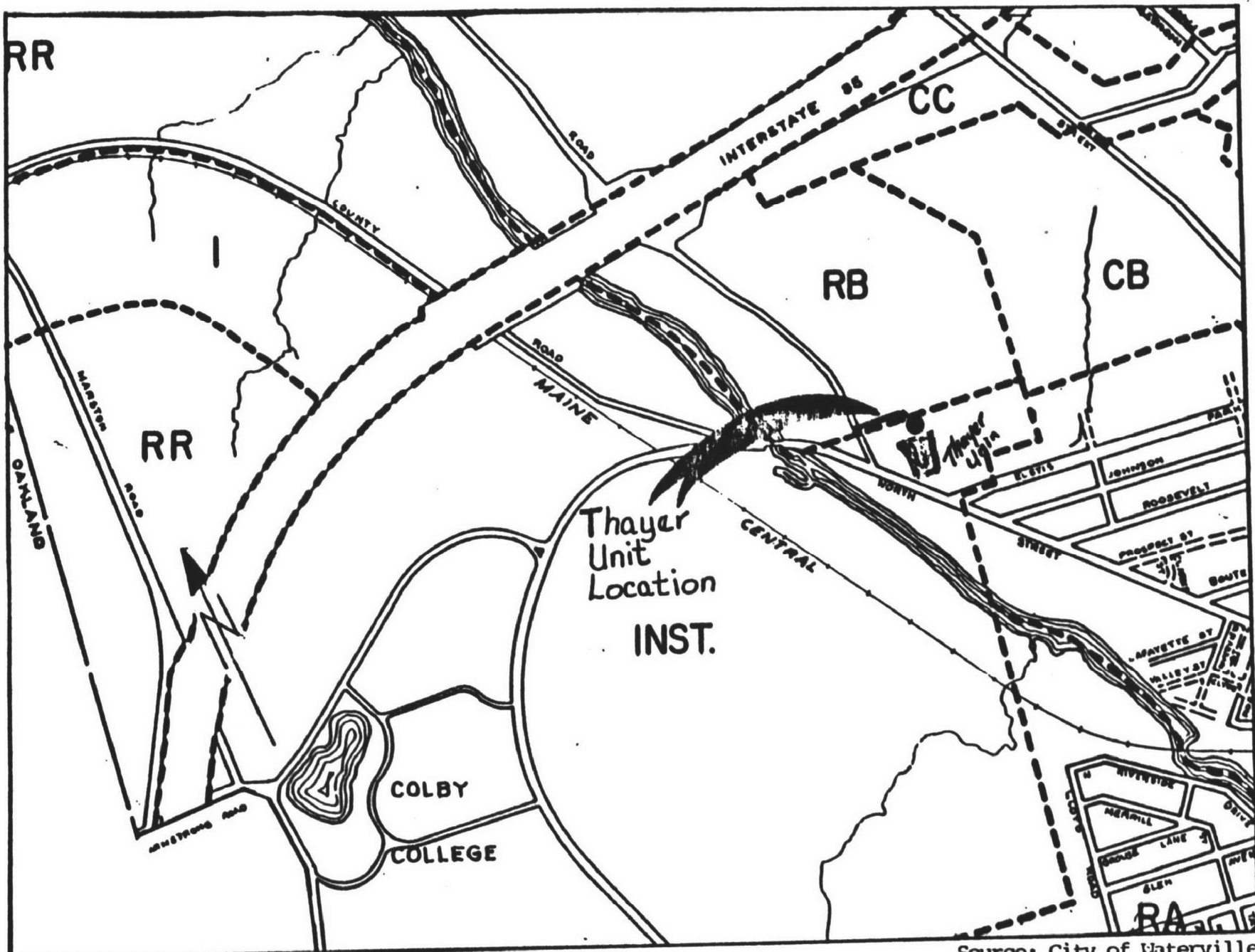
- Less than \$500.

OTHER ENVIRONMENTAL FACTORS/POTENTIAL PROBLEMS

Noise - far enough from the hospital to be no problem.

Emissions - must comply with State standards.

- Nearby residents/landowners - none within 0.1 miles except Thayer Unit. Mid-Maine Medical Center supports the concept of construction of resource recovery facility on their property.



Source: City of Waterville  
Zoning Map, 1979

Figure 3. LOCATION MAP PROPOSED RESOURCE RECOVERY FACILITY

PRELIMINARY COST ESTIMATE  
FOR SITE DEVELOPMENT - THAYER UNIT

Land acquisition, 2 acres @ \$1,000 per acre plus \$2,000 closing	\$ 4,000
Clearing and grading	
Clearing, 1½ acres @ \$2,000 per acre	3,000
Grading	6,000
Siltation control (during construction)	1,000
Access/Road, 24' wide, 700' long	
Clearing	2,000
Grading, 700' @ \$15/LF	10,500
Drainage culverts, CMP, 150' @ \$14/LF including end sections	2,100
Siltation control (during construction)	1,000
9" crushed stone base @ \$15/ton 24' wide x 700' long = 2,000 sy @ \$2.30/sy	4,600
3" asphalt paving @ \$16/ton, 12' wide x 700' long = 1,000 sy @ \$4.10/sy	4,100
Site Preparation	
Finished grading and 9" crushed stone base @ \$5/ton = 4,000 sy @ \$2.30/sy	9,200
2" asphalt paving @ \$16/ton = 2,500 sy @ \$4.10/ton	10,300
6' high chainlink fence with barbed wire guard, 900' @ \$9.00/LF	8,100
Utilities	
<u>Water</u>	
6" pipe, 700' @ \$14/LF	9,000
Connection to existing 20" line	2,000
Valves (2)	800
Fire hydrant	1,000
<u>Sewer</u>	
6" lateral, 1,000' @ \$13/LF	12,000
3 manholes @ \$1,000	3,000
Composite sampler	2,000
Metering structure	5,000
<u>Electric service</u>	NC
<u>Telephone service</u>	500



Subtotal	\$102,000
Contingencies and engineers, 25 percent	<u>25,000</u>
TOTAL	\$127,000