DOCKET NO. 46

AN APPLICATION SUBMITTED BY THE CONNECTICUT RESOURCES RECOVERY AUTHORITY, THE METROPOLITAN DISTRICT AND THE CONNECTICUT LIGHT AND POWER COMPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION OF A SOLID WASTE PROCESSING FACILITY, RECONSTRUCTION OF A POWER BLOCK (STEAM GENERATING) FACILITY, AND REFURBISHMENT OF THE SOUTH MEADOW ELECTRIC GENERATING STATION.	:	CONNECTICUT SITING COUNCIL
	:	December 20, 1984

F I N D I N G S O F F A C T

1. The Connecticut Resources Recovery Authority (CRRA), the Metropolitan District (MD), and the Connecticut Light and Power Company (CL&P), in accordance with provisions of sections 16-50k and 16-501 of the Connecticut General Statutes (CGS), applied to the Connecticut Siting Council on August 22, 1984, for a certificate of environmental compatibility and public need to construct a Solid Waste Processing Facility, reconstruct a Power Block Facility, and refurbish the existing South Meadows Electric Generating Station. The project is known as the Mid-Connecticut Project. (Record)
2. The fee as prescribed by section 16-50v-1 of the Regulations of Connecticut State Agencies (RSA) accompanied the application. (Record)
3. The application was accompanied by proof of service as required by section 16-501-1 of the CGS. (Record)
4. Affidavits of newspaper notice as required by statute and section 16-501-1 of the RSA were also filed with the application. (Record)
5. The Council and its staff made an inspection of the proposed facility site on November 7, 1984. (Record)

6. Pursuant to section 16-50m of the CGS, the Council, after giving due notice thereof, held public hearings at 6:30 P.M. in Temporary Building - West No. 58, Connecticut State Capitol, in Hartford, Connecticut, on November 7, 1984, and at 1:00 P.M. in the Council's offices at Central Park Plaza, New Britain, Connecticut, on November 9, 1984. (Record)

7. The parties to the proceeding are the applicants: CRRA, MD, and CL&P; and those persons and organizations whose names are listed in the Decision and Order which accompanies these findings. (Record)

8. The following state agencies filed written comments with the Council pursuant to section 16-50j of the CGS: the Department of Economic Development (DED), and the Department of Environmental Protection (DEP). (Record)

9. The proposed project consists of two parts, a Waste Processing Facility and a Power Block Facility. The Waste Processing Facility would cull, shred, and blend the Municipal Solid Waste (MSW) of 33 participating towns, provide the removal of combustibles, and convey the processed material to the Power Block Facility. The Power Block Facility would burn processed waste with or without low sulfur coal to generate steam, which would be converted to electricity. (CRRA I, p. 13; CRRA XV, Q. 32; Tr. 11/7/84, p. 101)

10. The primary objective of the proposed project is the environmentally safe disposal of waste. A secondary objective is to produce energy so that the first objective is accomplished in an economically efficient manner. (Tr. 11/7/84, p. 82)

11. The electrical generating equipment would have a useful life of 20-25 years. (CRRA I, p. 95)

12. Three VU-40 boilers, each with the capacity to burn one-half week's delivery of MSW over 7 days, would be utilized. Each boiler could burn coal, processed waste, or coal and processed waste in combination. (CRRA I, pp. 30, 34)

13. Boilers and turbine generators would be operated to the fullest extent possible around the clock. Such operation, with supplemental coal, would be economically most beneficial. (CRRA I, pp. 56-57)

14. The burning of oil in these boilers would be prohibited by the Fuel Use Act. (CRRA XV, Q. 32)

15. The capacity of Connecticut's landfills is expected to be exhausted by 1987. (CRRA I, p. 12; Tr. 11/7/84, p. 80)

16. The siting of new landfills is difficult because landfills pollute ground and surface water, use valuable land, and create a public nuisance. (Tr. 11/7/84, p. 81)

17. The proposed project would dispose of the MSW from at least 33 towns for 24 years and avoid putting at least 11 million tons of MSW into landfills. (Tr. 11/7/84, pp. 20-21)

18. The City of Hartford has an agreement with CRRA to lease two parcels of land in the North Meadows landfill, which has a DEP permit. One parcel, 38 acres, would only be used for ash and residues. The other parcel, 80 acres, would be used for coal disposal and by-pass ashes. With the 33 presently committed communities participating, this interim landfill would last approximately 20

years. Additional sites will be investigated. (CRRA I, p. 20; Tr. 11/7/84, pp. 90, 163, 164)

19. Fly ash which did not meet EPA toxicity standards would be disposed of in a city landfill near Niagara Falls, New York, at a cost of $75-80/ton. (CRRA 15, Q. 75)

20. The proposed project would result in a four-fold increase in available landfill capacity, resulting in a reduction of groundwater and surface water pollution, and a reduction in the amount of land committed for solid waste purposes. (Tr. 11/7/84, pp. 81-82)

21. The committed amount of MSW from the 33 participating towns is 1583 tons per day, to be received 6 days a week, 312 days per year. (CRRA XV, Q. 2)

22. Estimates of waste tonnage generation average 0.7 tons per person per year for the next 5-10 years. (CRRA 15, Exhibit 57, p. 14)

23. The Waste Processing Facility would be designed to accept and process 2000 tons per day of MSW into processed waste, which is about 30% of the state's daily MSW total. (CRRA I, p. 48; Tr. 11/7/84, p. 81)

24. Waste received at the proposed facility would include acceptable waste, unacceptable waste, and non-processible waste. Acceptable waste includes lumber, trees and their limbs, metal pipe, cans or drums, tires, tire buffings, household furniture, bulky waste, and garbage or trash normally collected by municipalities. (CRRA I, pp. 5-6)

25. Non-processible waste includes construction material, demolition debris, over-sized bulky waste, and any items not readily processible, or which could damage the separating equipment. Of all MSW collected, an estimated 2% would be non-processible waste. (CRRA I, pp. 7-8; CRRA XV, Q. 1)

26. Unacceptable waste includes explosives, pathological and biological waste, hazardous materials, radioactive materials, oil sludges, human waste, human and animal remains, motor vehicles, and liquid wastes. (CRRA I, p. 9)

27. Unacceptable waste and hazardous waste would not be delivered to the proposed facility, but would be sorted out of the waste stream by trained operators. Participating municipalities would also be responsible for preventing unacceptable and hazardous wastes from reaching the proposed facility. (CRRA XV, Q. 5; Tr. 11/9/84, pp. 245-246, pp. 235-237)

28. Over-sized and other non-processible waste would be disposed of in the North Meadows landfill. Hazardous or toxic wastes would not be handled at the proposed facility. Such wastes, if received, would be sent to an appropriate disposal facility. (CRRA I, p. 48)

29. Processed waste would always be the primary fuel for this project. As the amount of MSW increases, the project's dependence on coal burning would be reduced. The project could operate exclusively on processed waste should coal supplies be disrupted. (CRRA XV, Q. 29)

30. The project would recover 90% of the ferrous metal in its waste stream, which is normally disposed in landfills. This metal would be available for sale. (Tr. 11/7/84, pp. 82, 98)

31. It is expected that processed waste would compose 77.3% of the total waste output; ferrous metal 4.6%, and residue, including non-combustibles, would compose 18.1% of the total waste output. (CRRA I, p. 51)

32. The goal of the Waste Processing Facility is to remove from the fuel stream non-combustible items such as glass and metals. Any glass or non-ferrous metals removed before arriving at the proposed facility would be beneficial, as this would reduce the need to transport and sort these materials. (Tr. 11/7/84, pp. 152-153)

33. During normal operations, waste would be received, processed, and disposed of on the same day. During an emergency, 1½ day's collection of MSW could be held in storage. (CRRA I, p. 33)

34. The use of coal as a secondary fuel would allow the power plant to operate 24 hours a day, seven days a week. (CRRA I, p. 13)

35. About 222 two tons of coal would be burned daily with the presently committed waste stream. To ensure an adequate supply, a 60-90 day, 30,000 ton coal pile would be maintained. (CRRA I, pp. 54-56)

36. The amount of coal burned would depend on the boiler availability and the amount of processed waste available. In the first year of the project, coal is expected to comprise 24% of the fuel weight, with processed waste comprising 76%. By the project's fifth year, coal would comprise 15%, and processed waste 85%. (CRRA XV, Q. 35)

37. If a dry scrubber/baghouse system (scrubbers) were not used when coal and MSW are burned together, 0.9% sulfur coal would be burned; if coal were used exclusively, 0.7% sulfur coal would be burned. (CRRA XV, Q. 28)

38. The coal pile would be compacted and inspected daily for erosion and hot spots. (CRRA XV, Q. 38)

39. The coal pile would measure 250'x150' and be 30'-35' high. (CRRA I, Exhibit 22, p. B-36)

40. There would be two separate coal storage piles, one for .7% sulfur coal, and one for .9% sulfur coal, with the former being the smaller pile. (Tr. 11/7/84, pp. 222-223)

41. Leachate run-off from the coal pile would be collected in the coal pile run-off pond. (CRRA XV, Q. 41)

42. To retard seepage of trace minerals found in coal into the groundwater, all areas related to the coal storage operation, coal pile, coal pile run-off pond, and the holding pond would be underlain with a relatively impermeable synthetic liner. This liner would have a low permeability of 10^{-11} cm/second. About 11 gallons a day are expected to seep through the liner. Five monitoring wells would verify that groundwater quality is not being degraded. (CRRA I, Exhibit 22, pp. 36-37; CRRA I, Exhibit 62)

43. When the water level rose in the coal pile run-off pond, pumps would transport this water into a holding pond. When the holding pond reached a pre-set level, transfer pumps would pump water through a treatment facility to reduce suspended solids and metals, and to adjust the pH. This water would then be released into the Connecticut River. (CRRA XV, Q. 43; Tr. 11/7/84, pp. 157-158)

44. Fugitive dust control for the coal pile probably would not be necessary because the low sulfur washed coal contains enough moisture to prevent fugitive dust. Most of the coal would be in

a depression, which would serve as a natural windbreak. (CRRA XV, Q. 37, 38; CRRA I, p. 63)

45. If a fugitive dust problem arose, the applicant would be willing to take steps to mitigate the problem, such as covering the pile. (Tr. 11/9/84, pp. 226-231)

46. Every 10 days a coal barge would be expected to dock at the facility and unload coal at a maximum rate of 800 tons per hour for six hours. An electrically operated clam shell barge unloader would be utilized. (CRRA XV, Q. 22; CRRA I, pp. 55-56; LF 9)

47. To control possible fugitive dusts during coal barge unloading, a dust housing would be placed around the coal hopper, which would be connected to a baghouse dust collector. (CRRA I, p. 63)

48. Bottom and fly ash from processed waste burning would initially be 59,570 tons per year. Bottom and fly ash from coal burning would initially be 17,500 tons per year. (CRRA I, Exhibit 51)

49. Bottom ash and grate siftings would be quenched, dewatered, and transported to the North Meadows landfill. Fly ash would be put into storage silos and later brought to the landfill. A 38-acre portion of the landfill would only be used for ash and residues from the facility. (CRRA I, pp. 57-58; Tr. 11/7/84, p. 163)

50. Waste water from the Power Block Facility's washdown and spillage system would be conveyed to the MD sewer system for treatment. An oil separator would be installed to prevent passage of tramp oils into the sewer system. (CRRA I, pp. 78-81)

51. Waste water discharged from the Waste Processing Facility would go into the MD sewer system, after treatment with an oil separator. (CRRA I, pp. 78-81)

52. Waste water proposed for discharge to the Hartford sewerage system would have no adverse impact on the Hartford Water Pollution Control plant or the MD sewers. (CRRA I, Exhibit 56)

53. The primary air emissions expected from this project would be particulates, sulfur dioxide, and nitrogen oxide. Hydrocarbons, lead, and carbon monoxide would be emitted in lesser quantities. Hydrogen chloride would also be emitted during combustion of MSW. (CRRA I, pp. 67, 74)

54. The use of scrubbers would remove most sulfur dioxide and hydrogen chloride from the exhaust gases from the power plant by a chemical reaction that would convert these gases to particulate salts which would then be removed by a baghouse system. (CRRA XV, Q. 63)

55. With the use of scrubbers, hydrogen chloride removal efficiencies range from 90 to 95%. Sulfur dioxide removal efficiencies range from 80 to 90%. By lowering flue gas temperatures, scrubber baghouses capture some trace metals and trace organic compounds, and collect them in the baghouse. (CRRA XV, Q. 18)

56. Scrubbers have been proven to remove effectively both particulate and acid gas emissions, as well as control toxic air contaminants, such as dioxins. (CRRA XV, Q. 63; CRRA I, Exhibit 50)

57. Nearly all other states with pending applications for resource recovery facilities are requiring acid gas scrubbing. (CRRA XV, Q. 64; DEP letter of 8/23/84)

58. The applicant has entered into a stipulation agreeing to amend its application for the necessary federal Environmental Protection Agency incinerator/boiler emissions permit to include a dry gas scrubber and baghouse air pollution control system. (CRRA XIII)

59. The proposed project would have no appreciable impact on acid precipitation in Connecticut. (CRRA XV, Q. 11)

60. The proposed project is expected to have a negligible effect on ozone levels in Connecticut. (CRRA XV, Q. 10)

61. To control odors at the proposed facility, the raw waste and the processed waste would be stored under a roof, compacted, and processed as soon as possible. Under normal conditions, it would be processed the same day it is received. (CRRA I, p. 83)

62. During construction, traffic would cause some noise in the immediate vicinity of the proposed project. (CRRA I, p. 90)

63. When operating, shredders, conveyors, magnetic separators, crushers, fans, bulldozers in the coal pile, coal conveyance, coal barge unloading, and truck traffic would produce noise. (CRRA I, pp. 84-85)

64. Noise generated at the project has been calculated to be reduced from 65 dBA to 28dBA at the closest residence. This represents a reduction of approximately ten thousand fold. (CRRA I, p. 88)

65. The proposed project would have minimal impact on the visual or asthetic character of the South Meadows area. The dock and coal unloading equipment would be visible to boaters on the Connecticut River. The coal pile's visibility from Reserve Road, Maxim Road, or the Connecticut River would be very limited. (CRRA I, Exhibit 22; Tr. 11/7/84, pp. 154-155)

66. The new smoke stack at the proposed facility would be 218' high, and would consist of three flues approximately the same height as the tallest of the three existing stacks. The new stack would have a steadily burning red aviation obstruction light and a flashing red aviation beacon. A Federal Aviation Administration (FAA) permit has been received by the applicant. (CRRA I, Exhibit 40; CRRA I, p. 61; CRRA XV, Q. 82)

67. The proposed Power Block and Electric Generating Facility would be located at the existing CL&P South Meadow Generating Station, off of Maxim Road in Hartford. The Waste Processing Facility would be sited on an adjacent piece of land. (CRRA I, p. 14)

68. The proposed site is approximately 90 acres in size, and located within a mixed commercial and industrial area. Located nearby are Brainard Airport, a wastewater treatment plant, the Connecticut Regional Market, and a US Military Reserve Area. (CRRA I, p. 39; CRRA I, Exhibit 22, p. A-27)

69. The proposed site contains the existed generating station, four combustion turbine-generators, support facilities, two retired transformers, 115 kV transmission lines, a 115 kV substation, and six fuel oil storage tanks. (CRRA I, pp. 104-105)

70. The existing CL&P South Meadow Station was retired by CL&P in the 1970's. The building contains two 45 MW turbine-generators which would be refurbished and returned to service. No new electrical generating equipment or transmission lines would be necessary. (CRRA I, pp. 42-43)

71. Two thirds of the proposed site would be cleared for construction of the project. (CRRA I, Exhibit 22, p. B-19)

72. The Waste Processing Facility would be located in the southeast corner of the proposed site. The proposed facility would be a low rectangular building approximately 85,000 square feet in size. (CRRA I, Exhibit 22, p. B-40)

73. The Waste Processing Facility design would be reviewed by the Hartford fire Department to assure compliance with local codes and to assure that adequate access would be available to emergency vehicles and personnel. (CRRA I, p. 27)

74. All Occupational Safety and Health Administration (OSHA) mandated programming and standards applicable to the project would be initiated and maintained. (CRRA I, p. 27)

75. On March 31, 1983, the Hartford City Council approved the location of a proposed Waste Processing Facility at the proposed site by amending the Hartford Zoning Ordinances to permit a central garbage grinding/extraction station there. (CRRA I, p. 40)

76. There are no wetlands as defined by Connecticut law within the project area. (CRRA I, Exhibit 22)

77. The proposed site is of no known archaeological significance. (CRRA I, Exhibit 22)

78. The DEP has no records of rare, endangered, or threatened species occurring on the proposed site. (CRRA XV, Q. 64)

79. Fish passage through the Connecticut River would not be affected by the discharge of condenser flow water and circulating water, which would be 15 to 17 degrees Farenheit above ambient water temperatures but which would not spread across the entire river even under low flow conditions. (Tr. 11/7/84, pp. 121, 129; CRRA I, pp. 114-115)

80. Discharges of treated coal pile run-off and untreated coal pile leachate would dilute to low levels and not affect the flora and fauna of the Connecticut River. (Tr. 11/7/84, p. 121)

81. Riverfront Recapture Inc., an organization planning the revitalization of the Connecticut River waterfront, is proceeding with full knowledge of CRRA's proposed plans. (Tr. 11/7/84, p. 126)

82. A pedestrian walkway, Riverwalk, proposed by Riverfront Recapture Inc., could bypass the proposed CRRA facility by an inland detour via Reserve Road, but Riverfront Recapture prefers that the walkway continue south from the Charter Oak Bridge along the river side of the plant to Brainard Field. (CRRA 12, p. 24)

83. A visitor's center for the proposed CRRA facilities may be included in the Riverwalk plans. (CRRA 12, p. 24)

84. An average of 273 trucks carrying MSW would enter the proposed site via Maxim Road from 6:00 A.M. to 4:00 P.M. daily. Daily outgoing trucks would average as follows: scrap metal, 5; ash, 11; and residue, 16. There would therefore be an average of 300 round-trip truck trips daily. (CRRA I, p. 39; CRRA I, Exhibit 22, p. B-4)

85. CRRA would make road improvements to portions of Brainard, Maxim, and Reserve Roads under agreement with the City of Hartford. These improvements would include road reconstruction, curbing, resetting utilities, construction of a storm drain system, and the installation of traffic signals at the intersection of Murphy and Brainard Roads. (CRRA 12)

86. CRRA intends to monitor environmental consequences of the project and will implement any corrections necessary to remain within properly established environmental standards after the project enters

operation. (Tr. 11/6/84, pp. 29-30)

87. Construction of the proposed project would be expected to take 37 months. The processing of some waste could begin in late 1987. The project would be expected to go into operation on January 1, 1988. (CRRA I, pp. 16, 38, 86)

88. CRRA was established by the Connecticut General Assembly in 1973 as a non-profit organization and has the responsibility to develop a statewide solid waste management program with emphasis on resource recovery. (CGS §22a-257 to 22a-281) (CRRA I, p. 15)

89. The project would establish a comprehensive solid waste disposal program, conserve and protect Connecticut's natural resources, and generate electricity from an indigeneous resource, solid waste. (CRRA I, pp. 22-23)

90. The project furthers the objectives expressed in the State Plan of Conservation and Development as outlined in CGS §16a-24. (CRRA I, p. 22)

91. The project is designed to conserve and protect Connecticut's natural resources as expressed in CGS §22a-1. (CRRA I, p. 19)

92. The project furthers the state water resources and water quality policies as stated in CGS §22a-352. (CRRA I, p. 20)

93. State of Connecticut Energy Policy mandates that new sources of energy be developed and utilized, the efficiency of energy resource use be increased, the energy supply mix be diversified, and the state's energy supply be made less vulnerable to disruption. (Tr. 11/7/84, pp. 31, 82-83; CRRA I, p. 21)

94. The Connecticut Energy Advisory Board in the March 1984 Annual Report to the Governor and General Assembly, makes the following recommendations:

a) Emphasize fuel diversification as a major component of state energy policy;

b) Exploit renewable and indigenous energy resources and recover energy now wasted in Connecticut;

c) Stress indigenous small-scale, diverse, and flexible techniques for utilizing resources when appropriate, and seek opportunities to use renewable sources for generating electricity.

(Tr. 11/9/84, pp. 240-241; 1984 CEAB Report, Administratively noticed)

95. The project would generate 529 million kilowatt hours of electricity yearly, displacing an average of 750,000 barrels of oil annually over the life of the project. (CRRA I, p. 21; Tr. 11/7/84, p. 83)

96. The project would increase the efficiency of energy resource use, diversify the state's energy mix, reduce the vulnerability of the CL&P generating system, and enhance the reliability of the CL&P generating system by providing an additional 68 MW of capacity. (CRRA I, p. 22; CRRA I, Exhibit 15; Tr. 11/7/84, p. 83)

97. The DPUC found that incremental additions of electricity from refuse-derived power and the repowering of retired units are beneficial due to shorter construction lead times, have benign environmental impacts, enhance system reliability, and reduce financial burden on the utilities. (CRRA I, Exhibit 15; CRRA I, p. 22)

98. The DPUC found the project to be in the public interest and approved the principal financial methods for payment by CL&P for

the steam produced for the generation of electricity by the project. (CRRA I, Exhibit 15; CRRA, 1/26/84, p. 11-12)

99. The Connecticut Fund for the Environment, a party to the proceeding, supported the project if scrubbers are used for air pollution control. (Record)

100. Several participating municipalities expressed support for the project: West Hartford, Hartford, Newington, Vernon, East Granby, Rocky Hill, South Windsor, Chester, Old Lyme, Saybrook, and New Hartford. (CRRA III; CRRA IV; Tr. 11/9/84, pp. 213-214)

101. The CRRA will finance the design, construction, start-up, and testing of the Waste Processing Facility and the Power Block Facility through its bonding issue. The CRRA Board of Directors is required by CGS 22a-272(b) to find that the project will be economically self-sufficient, so that revenues from the sale of recovered materials and energy together with the waste disposal fees paid by the municipalities would be equal to the debt service cost and the operating and maintenance expenses. (Tr. 11/7/84, pp. 27, 82-83; CRRA I, p. 15; CRRA I, p.36; CRRA XV, Q. 84)

102. Since the Hartford landfill has a limited life, the proposed bond issue includes funding for purchase of additional land in the future. (CRRA XV, Q. 4)

103. The October, 1984, cost to dispose solid waste in the Hartford landfill is $14.70 per ton. Based on an estimated 2,000 tons of waste per day, the cost to landfill MSW is calculated to be $29,400 per day or $9.2 million per year, assuming on 313 operational days. (CRRA XV, Q. 56)

104. CL&P has no other location within the Mid-Connecticut Wasteshed area which could be developed into a refuse-to-energy facility. The South Meadow station's central location, existing transmission equipment, and available vacant land in an industrially zoned area are suitable for the proposed project. (CRRA I, p. 107)

105. CL&P would operate the Power Block Facility and Electric Generating Facility, including the boilers and associated steam production, electric generation, and necessary coal purchasing and handling, with CL&P power plant personnel at CRRA's expense. (CRRA I, p. 15)

106. CL&P would lease the space for the Power Block and coal handling facilities and the land for the Waste Processing Facility to CRRA. (CRRA I, p. 15)

107. Two main electrical output systems, each meeting the electric output requirements of one turbine-generator, would be provided by CL&P. Two main auxiliary electric supply systems would also be furnished by CL&P. (CRRA I, p. 111)

108. A CL&P consultant in 1979 studied the feasibility of using the present generators for the project and concluded this would be the most cost effective means for electric generation. Larger units could be installed. The costs and benefits of this possibility are still under review. (CRRA XV, Q. 24)

109. CL&P studies indicate the South Meadows Station could accommodate approximately 500 MW of additional new generation in the future with the project in place or 600 MW without the project. The present project configuration does not rule out future use of the site for additional generation. (CRRA XV, Q. 26; CRRA I, p. 105)

110. The plant capacity factor over the life of the project is estimated at 88 percent. The total net annual output of the two generators at this capacity level is expected to be 529,920,000 kWh. This would be considered baseload generation which would be dispatched whenever available. (CRRA XV, Q. 24; Q. 48; Tr. 11/9/84, p. 205)

111. The addition of the electricity generated by the project would not necessarily precipitate the retirement of any of CL&P's present facilities. This situation would be re-examined in the future. (Tr. 11/9/84, pp. 206-208)

112. All project costs incurred by CL&P would be reflected in CL&P's customer electric rates, including operation and maintenance, property tax, and other on-going expenses. These costs would be capitalized and would be included in the CL&P's rate base at the time the facility becomes operational. (CRRA XV, Q. 48)

113. CL&P's capital investment in the project is estimated at $40.4 million (nominal 1983$). The carrying charge on this investment is calculated at $128,673,000 from years 1987 to 2008. (CRRA I, Exhibit 68; CRRA I, Exhibit 69)

114. CL&P's avoided cost of electricity used to calculate the price of steam was 8.5 cents/kWh. CL&P expects its on-peak and off-peak avoided energy cost to exceed 8.5 cents/kWh in and after 1992 and 1994, respectively. CL&P's September, 1984, on-peak and off-peak costs are 5.1 and 4.0 cents/kWh respectively. (CRRA Exhibit XV, Q. 47)

115. CL&P's estimated ten year levelized busbar costs from the proposed project from year 1987 to 1996, would be as follows:

Capacity Factor	Cents/kWh
70%	11.4;
80%	11.0; and
90%	10.7.

(CRRA Q. 46, Q. 48)

116. CL&P's Mid-Connecticut project Operations and Maintenance (O&M) cost estimates by 1987 total $9.088 million (1987$). (CRRA I, Exhibit 71, p. 1)

117. Combustion Engineering (CE) would design and construct the new spreader stoker-fired boilers, all necessary ancillary equipment, pollution abatement equipment, as well as the Waste Processing Facility, all of which would be owned by the CRRA. (CRRA I, p. 16)

118. The total cost of constructing the facility to the first day of operation, exclusive of financing and including both CL&P and CRRA costs, is approximately $218 million. (Tr. 11/7/84, p. 172)

119. Major equipment costs, exclusive of scrubbers, are estimated as follows:

a. C-E spreader-stoker boilers	$31.0 million;
b. Pollution abatement equipment	$14.0 million;
c. Stack and related equipment	$ 1.0 million; and
d. Coal handling equipment	$ 8.5 million.

(CRRA XV, Q. 50)

120. A preliminary estimate of operating and maintenance costs per year for the project totals $23,088,000 (1983$), as follows:

a. Processing facility	$4,231,000;
b. Transfer stations and transportation	$2,509,000;
c. Power Block and Electric Generators	$6,805,000;
d. Coal purchase	$7,043,000;

e. CRRA project administration $2,300,000; and
f. Other O&M $ 200,000.

(CRRA XV, Q. 49, Q. 61; CRRA I, p. 37)

121. The project's annual labor force for the Coal Handling, Steam Generating Plant, and Turbine Generating Plant and waste processing facility is estimated to total 113 persons. The annual labor cost is estimated to total $4.492 million (1983$) including fringe benefits. (CRRA XV, Q. 45, p. 2; CRRA I, Exhibit 71, p. 2)

122. Adding a generator to one boiler in order to produce a system of three boilers driving three generators would require considerable additional equipment and lower boiler capacity, and would increase costs by an estimated $15-20 million (1983$). (CRRA 15, Q. 25)

123. Incremental costs to modify the proposed boilers to accept oil or natural gas as a fuel in addition to coal and MSW are as follows:

1) Add natural gas firing +$2.4 million;
2) Add oil firing +$8.6 million;
3) Add natural gas without coal -$6.1 million; and
4) Add oil without coal +$0.1 million.

These costs do not reflect building modifications and indirect engineering, construction management, and insurance. (CRRA 15, Q. 76)

124. Although estimated initial tipping fees range from $18 to $24 per ton using a variable interest rate demand note, higher tipping fees would have no effect on the price of electricity generated. (CRRA 15, Q. 52)

125. If the waste tonnage decreases over time, the per-ton tipping fee paid by the municipalities would increase, and vice versa. It is not possible to forecast the minimum MSW needed for economical

operation since tipping fees would be increased to cover costs. (CRRA 15, Q. 27)

126. Analyses of existing MSW incinerators indicate that incremental costs to install dry scrubbers with baghouse filter for air emission control would increase costs by $3.00 - $4.50 per ton (DEP) to $5.00 - $9.50 per ton (CRRA). (CRRA 15, Q. 51, p. 7)

127. Additions of dry scrubbers with baghouse filters could add from $1.90 to $8.40 per ton to the necessary tipping fee. (CRRA 15, Q. 51, p. 12; CRRA 15, Q. 63, p. 22)

128. CRRA considered the co-disposal of waste sludges from the MDC's Hartford Water Pollution Control Plant but rejected the proposal for technological and economic reasons. (CRRA Exhibit 15, Q. 34)

129. The use of peat instead of coal as a supplemental fuel was analyzed by CE Resource Recovery systems and rejected for economic and technological reasons. (CRRA 15, Q. 33)

130. The estimated annual amortization cost for CRRA's part of the project is $22.5 million, based on a 24-year payment schedule. CRRA expects the operational life of the facility to exceed this time period. (CRRA I, p. 36; CRRA Exhibit 18; Tr. 11/7/84, p. 174)

131. CRRA's financing arrangement schedule requires a bond rating from financial agencies in January, 1985, and a bond issue in February to take advantage of favorable financing conditions. (Tr. 11/9/84, pp. 196-197)

132. Tipping fees would increase approximately $6.70 per ton for each 100 basis point rise in interest rates. (CRRA 15, Q. 55; Tr. 11/9/84, pp. 197-198)

133. CRRA's total capital cost is estimated at $178,934,000 (1983$) exclusive of CL&P's costs to refurnish the electric generating facility. Additional expenses of $46,791,000 for interest payments would result in a bond size of $225,725,000 (1983$). (CRRA I, Part E, p. 36; CRRA Exhibit 17; Tr. 11/7/84, pp. 172-173)

134. A testing of stack emissions for dibenzo-P dioxins for three days, with analysis of the emissions, would cost about $50,000. (CRRA 15, Q. 79)

135. The existing railroad trackbed at South Meadows could be upgraded at a cost of approximately $500,000. However, truck transport of ash wastes would be more economical than shipment by rail. (Tr. 11/7/84, p. 137; CRRA 15, Q. 53)

136. Current price of 0.7-0.9 percent sulphur content coal is $65-75 per ton. (CRRA 15, Q. 31)

137. With the addition of scrubbers to the system and the expected increases in tipping fees, participating municipalities would be provided the opportunity to reconsider. If a sufficient number of municipalities declined to participate because the tipping fee exceeded an acceptable amount, the project would be terminated. (Tr. 11/9/84, pp. 210-211)

138. Final land use agreement leasing costs are still under negotiation between CL&P and the CRRA. The proposed initial agreement would run for five years at a fixed annual rent. Thereafter yearly rental increases would be based upon the Consumer Price Index. The CRRA would not be required to issue rental payments after the termination of the Land Use Agreement. (CRRA 15, Q. 54)