DOCKET NO. 64

AN APPLICATION OF THE DEXTER CORPORATION FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF A 48.5 MW COGENERATION FACILITY LOCATED IN WINDSOR LOCKS, CONNECTICUT.	:	CONNECTICUT SITING COUNCIL
	:	January 12, 1987

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

1. The Dexter Corporation (Dexter), in accordance with provisions of section 16-50k and 16-501 of the Connecticut General Statutes (CGS), applied to the Connecticut Siting Council (Council) on July 2, 1986, for a Certificate of Environmental Compatibility and Public Need to construct a 48.5 MW (net) cogeneration facility in Windsor Locks, Connecticut. The project is known as the Dexter Corporation Cogeneration Facility. (Record)
2. The fee prescribed by section 16-50v-1a 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(b) of the CGS. (Record)
4. Affidavits of newspaper notice as required by statute and section 16-501-1 of the RSA were filed with the application. (Record)
5. Pursuant to section 16-50j of the CGS, the Connecticut Department of Environmental Protection (DEP) and the Connecticut Department of Economic Development filed written comments with the Council. (Record)
6. The Council and its staff inspected the proposed site on September 29, 1986. (Record)

7. Pursuant to section 16-50m of the CGS, the Council, after giving due notice thereof, held a public hearing at 7:00 P.M., September 29, 1986, in the Windsor Locks Town Office Building, Windsor Locks, Connecticut. (Record)

8. The parties to the proceeding are the applicant and those persons and organizations whose names are listed in the Decision and Order which accompanies these findings. (Record)

9. The facility would consist primarily of a gas turbine, a high pressure waste heat boiler, a duct burner, and a steam turbine. (Dexter-1, pp. 1,4)

10. Dexter would own, control, and operate the facility as a qualifying cogeneration facility, as defined in the Public Utility Regulatory Policies Act of 1978, to simultaneously produce electricity and process steam. (Dexter-1, pp. 1,7; Dexter-6, Q. 61, Q. 59, Electrical Purchase Agreement)

11. Cogeneration can be one of the most energy efficient methods of generating electricity, process steam, and hot water. (Dexter-1, p. 7; Dexter-7)

12. The objective of the project would be to produce steam, hot water, and electricity for the C.H. Dexter Division, a manufacturer of specialty nonwoven paper products, and to produce electricity for Northeast Utilities (NU). (Dexter-1, pp. 1,8; Tr. p. 17; Dexter-7)

13. The facility would assure a cost-effective source of electric power and thermal energy to the C.H. Dexter Division mill. Failure to implement the project could reduce the scope of activity and economic viability of the mill. (Dexter-1, p. 7)

14. The facility would produce a maximum output of approximately 48.5 MW (net), with up to 39 MW of that going to NU. The balance of the electricity would be consumed by Dexter at the specialty paper mill. (Tr. p. 17; Dexter-1, p. 8)

15. The facility would produce about 180 million kilowatt-hours (Kwh) of electricity per year on-peak and about 155 million Kwh per year off-peak. (Dexter-6, Q. 7)

16. Electric power provided to NU by the facility could help offset the need for future generating capacity. (Dexter-1, p. 7)

17. The proposed electric purchase contract between Dexter and NU would become effective January 1, 1990. All electricity and steam produced by the facility prior to that date would be for Dexter's use only, with the possible exception of electricity which would be sold to NU at a separate purchase rate. (Tr. pp. 17-18)

18. In 1990 the contracted floor price would be 6.3 cents/Kwh on-peak and 4.6 cents/Kwh off-peak. (Dexter-6, Q. 1)

19. The proposed electric purchase agreement contains a pricing structure in which payments for the facility's electricity over the 20-year term of the agreement are projected to be less than 100 percent of NU's avoided costs. (Tr. p. 26; Dexter-6, Q. 2, Q. 8, Q. 59, Electricity Purchase Agreement)

20. The front-loaded contract would be used to provide Dexter with an electrical purchase rate greater than NU's avoided costs early in the contract, but with an electrical purchase rate lower than NU's

avoided costs in the later years of the contract. (Dexter-6, Q. 5, Q. 59, Electricity Purchase Agreement)

21. For the term of the Electricity Purchase Agreement, NU would recover its costs in a manner at least as favorable to NU as the manner in which NU is authorized by state and federal law to recover its fossil fuel expenses. (Dexter-6, Q. 59, Electricity Purchase Agreement)

22. Dexter would make all reasonable efforts to accommodate changes in the facility's operation schedule requested by NU, whether made for NU's own electric system requirements or to accommodate requests by the New England Power Pool. (Dexter-6, Q. 59, Electricity Purchase Agreement)

23. Dexter would operate the facility in compliance with NU's operating rules and regulations for cogeneration and small power production facilities as approved by the Connecticut Department of Public Utility Control. (Dexter-6, Q. 59, Electricity Purchase Agreement)

24. Upon notification from NU that operation of the facility is causing or substantially contributing to an abnormal condition that has an adverse impact on the quality of NU's electric system or its customer, Dexter would immediately adjust operation to the extent required to eliminate such adverse impact. (Dexter-6, Q. 59, Electricity Purchase Agreement)

25. Dexter would provide the same level of electrical energy and capacity during the later years of the contract term as during the earlier years of the contract term. (Dexter-6, Q. 5, Q. 59, Electricity Purchase Agreement)

26. The facility is expected to operate at an annual capacity factor of approximately 74 percent, based on winter maximum capability. (Dexter-6, Q. 5, Q. 59, Electricity Purchase Agreement)

27. The electrical interconnection would be designed, built, and maintained by NU at the expense of Dexter. (Dexter-6, Q. 5, Q. 59, Electricity Purchase Agreement)

28. The primary fuel for the project would be natural gas, with number 2 fuel oil used as a back-up when natural gas was not available. (Dexter-1, pp. 5,19)

29. The equivalent of approximately 2.5 million gallons/year of fuel oil would be conserved by the facility when compared to existing methods of achieving the same level of thermal and electrical output. (Dexter-1, p. 7; Dexter-9)

30. On an annual average basis, approximately 400 million British thermal units per hour of fuel would be consumed to produce 38.6 MW of electricity, 82,075 lb/hour of superheated steam at 300 pounds per square inch gauge pressure (PSIG), and 47,500 gallons/hour of water at 105°F. (Dexter-1, p. 20)

31. Based on a worst case planning scenario with 120 days of natural gas curtailment and maximum operating conditions, the annual fuel consumption for the facility would consist of approximately 9.3 million gallons of Number 2 fuel oil (0.5 percent sulfur content) and 2.5 billion cubic feet of natural gas. (Dexter-1, Appendix C)

32. Natural gas would be supplied to the facility by way of new or upgraded, 100-pound-per-square-inch pipelines owned by the Connecticut Light and Power Company (CL&P). On site, three electric compressors (60 percent capacity, 600 horsepower) would

boost the gas from 100 to the 300 psig required by the turbine. (Dexter-1, p. 5; Dexter-6, Q. 17)

33. Two above-ground, carbon steel fuel oil tanks would have the capacity to fire the facility for at least 60 hours at full operation. The fuel oil day tank would measure 20 feet in diameter by 21 feet height and have a capacity of 50,000 gallons. The primary storage tank would measure 40 feet in diameter by 31 feet in height and have a capacity of 300,000 gallons. (Dexter-1, p. 6; Dexter-6, Q. 15, Q. 16)

34. Both fuel oil tanks would have flame arrestors and be contained in separate diked areas, each with 110 percent of the capacity of the fuel tank it contains. (Dexter-6, Q. 16)

35. If the gas supply were to be interrupted, the facility's fuel oil consumption would average about 75,000 gallons per day. Delivery of roughly 11 truck loads of fuel oil per day would be required to meet this need. (Dexter-1, p. 32)

36. The facility would be designed, built, and operated under all applicable codes and standards listed in the application. (Dexter-1, p. 8)

37. General protection systems would include overspeed trip devices, enclosed fire and gas detectors, fuel shut-off valves, over-temperature systems, vibration detection systems, and temperature, pressure, and speed sensing devices. (Dexter-1, p. 9)

38. If a fire were detected, all compressor units and fuel oil pumps would be shut down, isolated, and blown down, and the fire suppression system would be triggered. (Dexter-1, p. 10)

39. Electric devices would be insulated, grounded, sealed (potted) to prevent entry of explosive gases where necessary, and tested to ensure proper operation and performance. (Dexter-1, pp. 10-13)

40. The facility would automatically shut down in the event of a cooling system failure, low or high fuel pressure, or abnormal boiler water level. (Dexter-1, p. 11; Dexter-6, Q. 38)

41. The facility would be capable of automatically switching between primary and secondary fuel sources with no noticeable changes in turbine operation. (Dexter-1, p. 14)

42. An employee safety program that would include use of personnel safety equipment, first aid, and plant safety would be developed and maintained at the facility. (Dexter-1, p. 16)

43. The annual average efficiency of the facility for the first year of operation would be 64.8 percent. In subsequent years as Dexter's thermal demands grow, the average efficiency would increase. Peak system efficiency would be approximately 80 percent. (Dexter-6, Q. 19; Dexter-1, p. 20)

44. The ratio of output between electricity and thermal energy would be approximately 51 percent electricity (33 percent of the incoming fuel energy) to 49 percent thermal energy (32 percent of the incoming fuel energy). (Dexter-1, p. 20)

45. The combustion turbine, a General Electric gas turbine Model PG-6531 (Frame 6) or equivalent, has a history of high reliability and is expected to operate 95 percent of the time. Maintenance for the combustion turbine would consist mainly of annual boroscope and combustion inspections, a hot gas path inspection

once every three years, and a major inspection/overhaul once every six years. (Dexter-1, pp. 1,15)

46. Reliability of the steam turbine would approach 99 percent. Scheduled maintenance would consist of annual bearing and boroscope inspections and a major overhaul typically scheduled on a five-year cycle. (Dexter-1, p. 15)

47. The waste heat recovery boiler would have a reliability greater than 95 percent. Maintenance would be performed at the same time as the combustion turbine inspection. (Dexter-1, p. 15)

48. In the event of a shut down of the gas turbine generator, the existing Dexter boilers would be used to produce the required steam flow and hot water. (Dexter-1, p. 14)

49. The estimated installed plant cost, including site preparation, materials, engineering, financing, and all other significant costs would be 50 million dollars. (Dexter-6, Q. 3; Dexter-1, p. 17)

50. The financing plan would call for a minimum equity investment by Dexter of 10 million dollars and long-term debt financing of 40 million dollars. (Dexter-6, Q. 3)

51. Annual operating costs, including fuel, are forecast to total in excess of 17 million dollars in 1990, the first full year of operation, and in excess of 54 million dollars in the twentieth year. (Dexter-6, Q. 4)

52. In July 1986, Dexter projected that on-site construction would begin in March 1987 with mechanical erection commencing by May 1987. Testing would begin in June 1988 with commercial operation targeted for late 1988. (Dexter-1, p. 17)

53. The site is zoned commercial/industrial. Surrounding land use is a suburban/industrial/residential mix. The nearest residences are approximately 0.1 miles to the west of the facility on Main Street. (Dexter-1, p. 28)

54. A school, a library, and the Town Hall are all approximately one half mile from the facility. Dexter Plaza, a shopping center, is also about 0.4 miles away to the north-northwest. A four-story building, the Montgomery Company, is 0.2 miles to the north. (Dexter-1, p. 28)

55. The site, which Dexter owns, consists of two-thirds of an acre of land between the Windsor Locks Canal and the Connecticut River immediately south of the existing C.H. Dexter Division paper mill. (Dexter-1, p. 17, Dexter-6, Q. 59)

56. Main highways in the area include Main Street, a two-lane, secondary state road immediately to the west; I-91, a four-lane highway about 0.2 miles to the south; and Route 140, a two-lane road about 0.2 miles to the north. (Dexter-1, pp. 18, 19, 28)

57. Part of the site is paved as a storage area and the remainder is vegetated with trees and shrubs. It is estimated that less than 25 percent of the existing trees would be removed. All trees within 15 feet of the river's edge would remain. No significant displacement of known wildlife would occur. (Dexter-1, p. 30; Dexter-6, Q. 52; Dexter-12)

58. Only the electrical interconnection and approximately 70 feet of the stack would be visible above the tree line from the river. (Dexter-12)

59. The Windsor Locks Historical Society has no objections and approves of the proposed project. (The Windsor Locks Historical Society letter, 9/13/80)

60. The State Department of Economic Development supports the project for the effective utilization of production facilities, reduction of production costs to remain competitive, and maintenance of the employment base. (Connecticut Department of Economic Development letter, 10/23/86)

61. An erosion and sedimentation control plan has been designed as part of Dexter's application to DEP for a Stream Channel Encroachment Permit. (Dexter-6, Q. 41, Stream Channel Encroachment Permit Application)

62. There are no known endangered, threatened, or species of special concern occurring on the site. Species of concern which use the general area but would not be expected to be adversely affected include the bald eagle; the shortnose sturgeon; and a fresh water snail, the Goniobasis virginica gastropod. (DEP, Natural Resources Center letter, 6/19/86)

63. Major components of the facility, including the combustion turbine and generator, heat recovery boiler, steam turbine and generator, switchgear, and controls, would be located above the 100-year flood level. Auxiliary equipment located below this level would be either floodproofed or removable. (Dexter-6, Q. 51)

64. Discharges from the facility would include stormwater run-off, sanitary wastewater, cooling water, boiler blowdown, make-up demineralizer regeneration wastes, chemical area drainage, and floor drainage. (Dexter-1, p. 22)

65. Boiler blowdown, make-up demineralizer regeneration wastes, and drainage from the chemical areas would be subjected to neutralization, sedmentation, and coagulation, then discharged to the Connecticut River at a maximum temperature of 85°F. (Dexter-1, p. 22; Tr. p. 30; Dexter-6, Q. 23, Q. 31, Section 316(b) demonstration, p. 4)

66. Floor drain discharges would be treated with an oil/water separator and discharged into the Connecticut River. (Dexter-1, p. 22; Tr. pp. 30-31)

67. Total flow from boiler blowdown, make-up demineralizer regeneration wastes, and drainage from chemical areas would average approximately 80,000 gallons per day (gpd), approximately 43,700 gpd less than the existing C.H. Dexter Division boilers. (Dexter-1, p. 7; Dexter-8, NPDES Application; Dexter-6, Q. 28)

68. Sanitary wastes would be sent to the city sewer line and eventually to the Town of Windsor Locks Wastewater Treatment Plant. (Dexter-1, p. 22)

69. The C.H. Dexter Division currently discharges 1.3 million gallons per month of sewage to the Windsor Locks Sewage Treatment Plant. The estimated additional sanitary discharge to the plant from the new cogeneration facility would be less than 15,000 gallons per month, an increase of about one percent. (Dexter-6, Q. 29)

70. Cooling water used for the steam turbine cooling system would be drawn from the Windsor Locks Canal, heated to approximately 105-110°F, and then discharged into the Connecticut River at a rate of 10,500 gallons per minute (gpm) or 23.4 cubic feet per second (cfs). (Dexter-1, p. 22; Dexter-6, Q. 31; Dexter-8 Section 316 (b) demonstration p. 4; Tr. p. 37)

71. The volume of cooling water discharge equals .14 percent of the 7,385,000 gpm average flow of the Connecticut River. (Dexter-6, Q. 31)

72. The volume of the cooling water intake equals 3.9 percent of the flow of the Windsor Locks Canal, which is approximately 269,316 gpm. (Dexter-6, Q. 31; Dexter-8, Section 316(b) demonstration)

73. Based on conservative modeling assumptions, including low river flow, maximum discharge rate, and maximum discharge and river temperatures, the largest thermal discharge plume (estimated at 5°F above ambient) would occupy an area of approximately one-fifth acre, 95 feet downstream and 200 feet offshore, and would never be deeper than 4.5 feet. (Dexter-6, Q. 31; Dexter-8, Section 316(a) demonstration; Tr. p. 37)

74. As an alternative cooling system, Dexter considered using a cooling tower. This was rejected due to space limitations and the possibility of fogging on Route 159 and I-91. (Dexter-6, Q. 37)

75. If fish entrainment and impingement bore the same relationship to total estimated fish populations in the Connecticut River as intake flows bear to total river flow (0.2 percent), the facility would impinge and entrain less than 4,000 fish per year. However, because the intake structure would divert water from the Windsor Locks Canal, not the Connecticut River, fewer fish would be affected. (Dexter-11)

76. The intake structure has a submerged design to meet the 0.5 feet per second approach velocity recommended by the Environmental Protection Agency. (Dexter-8, Section 316(b) demonstration)

77. The thermal plume is not expected to have any significant effect on the dissolved oxygen levels, ecology, aquatic life, water stratification, or water quality of the Connecticut River. (Dexter-6, Q. 31, Q. 32, Q. 33; Dexter-8, Section 316(a&b) demonstration)

78. Sodium hypochlorite or chlorine would be added to the cooling system. Levels of residual chlorine in cooling system effluent would be lower than the 0.2 mg/l Federal Standard. (Dexter-6, Q. 35)

79. The temperature of the cooling water and waste water would be continuously monitored for temperature before discharge into Connecticut River; however, no monitoring of toxicity would be performed on discharge. (Dexter-6, Q. 30)

80. DEP would regulate all wastewater, cooling water, and stormwater discharges to the Connecticut River and the Town of Windsor Locks Wastewater Treatment Plant to meet applicable standards. (Dexter-6, Q. 61, Q. 31; Dexter-8, Section 316 (a&b) demonstration, NPDES Permit Application; DEP letters 10/9/86 and 9/29/86)

81. The facility would use 500 gallons per day of potable water. (Dexter-1, p. 22)

82. Primary air pollutants of the facility would include nitrogen oxides (NO_x), sulfur dioxide (SO_2), total suspended particulates (TSP), carbon monoxide (CO), and hydrocarbons (HC). (Dexter-10)

83. When compared to the emissions of the existing Dexter boilers, all primary air pollutant emissions from the proposed facility would be increased, but would still be within allowable emission standards. (Dexter-10)

84. In July 1986, Dexter anticipated, subject to the final DEP order, that the air pollution control system would consist of water injection and low NO_x burners on the duct burner for control of NO_x, use of low sulfur fuels for SO_2 control, and good combustion controls for limiting HC and CO emissions. (Dexter-1, Appendix C)

85. Dexter would comply with any continuous air emission monitoring requirements imposed by DEP. It is expected that DEP would require continuous stack monitoring for NO_x. (Dexter-1, p. 22)

86. An exhaust stack extending 125 feet above grade was designed according to Good Engineering Practice (GEP) to provide for appropriate pollutant dispersion. (Dexter-6, Q. 45)

87. The Federal Aviation Administration has ruled that the stack would not be a hazard to air navigation and would not require obstruction marking or lighting. (Dexter-1, Addendum 1, FAA Stack Approval)

88. The DEP Air Compliance Unit would set standards and regulate the emissions of air pollutants from the facility to meet applicable standards. (Dexter-1, Appendix C)

89. No prominently discrete tones would be audible at the nearest residential property line. (Dexter-6, Q. 47)

90. Noise levels at the library, school, and town hall are projected to be less than 39 dBA. (Dexter-6, Q. 48)

91. A noise level survey would be conducted at the completion of the project to determine whether design goals had been met and that all state and local noise regulations had been compiled with. (Dexter-6, Q. 49)

92. Two bridges, a south bridge with a six-ton capacity and a north bridge with a 16-ton capacity, would provide access to the site. Access for heavier loads during construction would be provided by cranes or by a temporary bridge. The U.S. Coast Guard has given approval for the construction of a temporary bridge. (Dexter-1, p. 30; Dexter-6, Q. 22; Tr. p. 29)

93. No significant effects to local traffic patterns would be expected from the facility operation. Minor, short-term tie-ups might occur as construction equipment was moved to and from the site. (Dexter-1, pp. 30-32)