DOCKET NO. 265 - Dominion Nuclear Connecticut, Inc. application to modify an existing electric generating facility (Millstone Power Station) to establish an independent spent fuel storage installation on property located off Rope Ferry Road, Waterford, Connecticut.	}	Connecticut
	}	Siting
	}	Council
		May 27, 2004

Findings of Fact

Introduction and Procedural History

1. Dominion Nuclear Connecticut, Inc. (DNC) in accordance with the provisions of General Statutes §§ 16-50g through 16-50aa, applied to the Connecticut Siting Council (Council) on August 25, 2003 to modify an existing electric generating facility (Millstone Power Station) to establish an independent spent fuel storage installation (ISFSI) on property located off Rope Ferry Road, Waterford, Connecticut. (DNC Exhibit 1, p. 1)

2. The parties in this proceeding are the applicant, Town of Waterford, Connecticut Coalition Against Millstone ("CCAM"), Southeastern Connecticut Council of Governments, Attorney General Richard Blumenthal, Dr. Milton C. Burton, Clarence O. Reynolds, Geralyn Cote Winslow, and William H. Honan. (Record)

3. Pursuant to General Statutes § 16-50m, the Council, after giving due notice thereof, held a public hearing on October 16, 2003, beginning at 7:00 p.m. at the Waterford Town Hall Auditorium, 15 Rope Ferry Road, Waterford, Connecticut. The Council held evidentiary hearings on December 15, 2003, January 7, January 20, and February 19, 2004 at the Institute of Technology and Business Development, Central Connecticut State University (CCSU), 185 Main Street, in New Britain. (Council's Hearing Notice; 10/16/03 Transcript, p. 2 (Tr. 1); 12/15/03 Tr. 2, p. 3; 1/7/04 Tr. 3, p. 3; 1/20/04 Tr. 4, p. 3; 2/19/04 Tr. 5, p. 3)

4. The Council performed an inspection of the proposed site on October 16, 2003, beginning at 4:00 p.m. (Council's Hearing Notice dated September 29, 2003)

5. Pursuant to General Statutes § 16-50l(e), the applicant, on June 17, 2003, submitted a technical report describing the proposed facility to the Town of Waterford Planning Director, Environmental Planner, and Town Attorney. Because a portion of the Millstone Power Station property is within 2,500 feet of the Town of East Lyme municipal boundary, technical information was provided to the East Lyme First Selectman. (DNC Exhibit 1, p. 5; DNC Exhibit 3, p. 3)

6. The applicant fulfilled service and filing requirements pursuant to General Statutes § 16-50l (b). Also, a public notice was published in the New London Day on August 21 and 22, 2003. (DNC Exhibit 1, p. 5, DNC Exhibit 2)

7. Pursuant to General Statutes § 16-50j (h), on September 11, 2003 and February 20, 2004, the following state agencies were solicited to submit written comments regarding the proposed facility; Department of Environmental Protection (DEP), Department of Public Health (DPH), Council on Environmental Quality (CEQ), Department of Public Utility Control (DPUC), Office of Policy and Management (OPM), Department of Economic and Community Development (DECD), and the Department of Transportation (DOT). (Record)

8. Written comments were received from the DOT, Office of Environmental Planning on October 7, 2003, and the DEP on December 9, 2003. Major John Buturla, State Deputy Director of Homeland Security, provided oral testimony on the nature of security and emergency response duties. (Record; 01/20/04 Tr. pp. 8-28)

9. DNC is licensed by the Nuclear Regulatory Commission (NRC) in accordance with 10 Code of Federal Regulations (CFR) Part 50 for the operation and maintenance of a nuclear-fueled electric generation facility consisting of Millstone Unit 1, Unit 2, and Unit 3. (DNC Exhibit 1 p. 3, DNC Exhibit 3, Q. 7)

10. Millstone Unit 1 began commercial operations in 1970 and has permanently ceased operations in 1998. Millstone Unit 2 began commercial operations in 1975 with a nominal electric generating output of 870 MW. Millstone Unit 3 began commercial operations in 1986 with a nominal electric generating output of 1,150 MW. Current NRC licenses for Millstone Units 2 and 3 are scheduled to expire in 2015 and 2025, respectively. (DNC Exhibit 1, pp. 6 and 10; DNC Exhibit 7; DNC Exhibit 16, Qs. 50 and 51).

11. DNC applied for license renewal for both Units 2 and 3 on January 22, 2004. If the license renewals are granted, Unit 2's license period would be extended to 2035 and Unit 3's license period would be extended to 2045. (DNC Exhibit 1, pp. 6 and 10; DNC Exhibit 7; DNC Exhibit 18).

12. Any power reactor site licensed under 10 CFR Part 50 may use a dry storage system for spent nuclear fuel. Furthermore, NRC regulations (10 CFR Part 72) establish licensing requirements for an ISFSI. Specifically, 10 CFR Part 72.212 states "The general license is limited to that spent fuel which the general licensee is authorized to possess at the site under the specific license for the site." and that "This general license is limited to storage of spent fuel in casks approved under the provisions of this part." While the NRC could amend a general licensee to allow an existing nuclear electric generating station to accept transshipment of spent nuclear fuel, DNC is not proposing to transship spent nuclear fuel nor receive spent nuclear fuel. (DNC Exhibit 5, Q. 4, Attachment 4; DNC Exhibit 14, Q. 16; 1/7/04 Tr. pp. 99-102)

Scope of Jurisdiction

13. The Nuclear Waste Policy Act of 1982 assigned the Department of Energy (DOE) as the federal agency to establish, construct, and operate a national repository for spent nuclear fuel from commercial reactors. At present, there is no national disposal site; however, DOE intends to submit a license application to the NRC for construction of a national repository at Yucca Mountain in Nevada by December 2004 and a target date to accept spent nuclear fuel for permanent disposal by 2010. (DNC Exhibit 5, Q. 2; 1/7/04 Tr. pp. 61-64).

14. As established in Northern States Power versus Minnesota, the federal government has preemptive authority over radiological health and safety issues associated with nuclear power plants. State agencies may not regulate the dry storage activities authorized by the NRC relative to radiological health and safety or impose siting standards in a manner that would frustrate or undermine NRC decisions related to the storage of spent nuclear fuel. (DNC Exhibit 1, pp. 11-12; 12/15/03 Tr. pp. 4-6; (**Maine Yankee Atomic Power Co. v. Bonsey**, 107 F. Supp. 2d 47 (D. ME 2000) following **Northern States Power Co. V. Minnesota**, No. 71-1093 (447 F.2d 1143, 3 ERC 1041) (8th Cir. September 7, 1971))

15. Radiological safety at commercial nuclear power stations across the country is under the exclusive jurisdiction of the NRC. Millstone Power Station has more than one NRC inspector on site at all times. In addition, the State, like every state, has an assigned NRC State Liaison Officer to communicate any State concerns and viewpoints to NRC staff. (**Maine Yankee Atomic Power Co. v. Bonsey**, 107 F. Supp. 2d 47 (D. ME 2000) following **Northern States Power Co. V. Minnesota**, No. 71-1093 (447 F.2d 1143, 3 ERC 1041) (8th Cir. September 7, 1971)); 2/19/04 Tr. p. 181).

16. Consistent with the Council's jurisdiction, the scope of the proceeding was limited to the siting of the ISFSI at Millstone, specifically the public benefit of and the need for the ISFSI, its location and its potential impact on the environment. (10/16/03 Tr. p. 3; 12/15/03 Tr. pp. 6-7)

17. The proceeding was intended and did not address the current operations of the Millstone facility except as those operations directly relate to the ISFSI. (10/16/03 Tr. p. 3; 12/15/03 Tr. pp. 6-7).

Existing Property

18. Millstone Power Station consists of a 520-acre parcel located south of Rope Ferry Road (Connecticut Route 156) in the southwest portion of the Town of Waterford, Connecticut. Millstone Power Station is bounded on the north by Rope Ferry Road, on the west by Niantic Bay, on the south by Long Island Sound and Jordan Cove, and on the east by Gardiner's Wood Road, a residential neighborhood (see Appendix A). (DNC Exhibit 1, p. 6 and Tab 7 Figure 1).

19. The power generating units, turbine buildings, and associated support buildings are located in the southernmost portion of the Property within a 49.3-acre area encompassed by security physical barriers and to which access is controlled (Protected Area). The Protected Area was established and is maintained in accordance with requirements established by the NRC. (DNC Exhibit 1, p. 6; DNC Exhibit 9 at 1).

20. Areas outside of the Protected Area consist of employee parking areas, office and storage buildings, training facilities, an electric switchyard and transmission lines. DNC maintains baseball, soccer and football fields used by the Town in the northeast portion of the property. All remaining areas of the Property are maintained as open space. (DNC Exhibit 1, p. 7).

Spent Fuel Management

21. In planning for spent fuel management and in evaluating when additional storage would be required, one of DNC's operational objectives is to maintain sufficient capacity in each unit's spent fuel pool to store at least all fuel in the reactor core as well as the spent fuel that has been permanently removed from the reactor during past refueling. This practice, which is known as maintaining "full core reserve," is based on operational safety, economic and practical considerations and is employed at other nuclear power plants in the United States; however this practice is not required by the NRC. (DNC Exhibit 5, Q. 3; DNC Exhibit 7 at 2-3; DNC Exhibit 16, Q. 19; 1/7/04 Tr. p. 56).

22. As a matter of practice, the Millstone Unit 3 reactor is completely de-fueled during each refueling outage (generally every 18 months) and the Unit 2 reactor is completely de-fueled at a historical frequency of about one out of every three refueling outages. (DNC Exhibit 16, Qs. 19, 40; 1/7/04 Tr. pp. 206-07)

23. Complete de-fueling is also essential for required inspections and/or maintenance. Maintaining full core reserve capability during the operating cycle of Units 2 and 3 further allows for some unexpected event that may require removal of all fuel from the reactor. (DNC Exhibit 16, Qs. 19, 40; 1/7/04 Tr. pp. 206-07).

24. A dry storage system would allow DNC to remove fuel from the Millstone spent fuel pools, thereby freeing space in the spent fuel pools to both accommodate spent fuel from more recent refueling and to maintain full core reserve capability into the future. (DNC Exhibit 1, p. 8).

25. The ISFSI is used for the interim storage of spent fuel at Millstone until the U.S. Department of Energy (DOE) fulfills its statutory and contractual obligations and accepts the fuel for permanent disposal. The ISFSI is neither a long term (defined as type of permanent disposal) storage site nor permanent repository for the storage of spent fuel. (DNC Exhibit 1, p. 8; DNC Exhibit 5, Q. 9).

26. Currently, DNC stores spent fuel from each of the Millstone units in the respective spent fuel pool for that unit. The storage of spent fuel is incidental to the principal use of the Millstone property for the generation of electricity. The ISFSI is an alternative method of storing spent fuel incidental to and in support of Millstone's existing power generating operations and would not change the existing, principal use of the Millstone property. (DNC Exhibit 1, p. 8; DNC Exhibit 7 at 2-3).

27. The ISFSI site has been designed to be used in conjunction with the existing spent fuel pools and could include 85 horizontal storage modules (HSMs) and dry-shield canisters (DSC) to provide spent fuel storage to maintain full core reserve capability for Millstone Units 2 and 3 through the end of the units' license periods including license renewal, (see table below) and, if further approved, 50 HSMs for the storage of spent fuel to support contingency events (i.e. operational, regulatory or unknown) in Units 1, 2 or 3.

    Number of HSMs required to maintain full core reserve versus license expiration.

	Millstone Unit 2	Millstone Unit 3
Current license expiration	2015	2025
Loss of full core reserve capability	2005	2020
Number of HSMs to maintain full core reserve capability to end of current license period	18	3
Renewal license expiration	2035	2045
Number of HSMs to maintain full core reserve capability to end of renewal license period	27	37
Total number of HSMs to maintain full core reserve capability under its current license and to the end of renewal license period	27 +18 =45	3 + 37 =40

(DNC Exhibit 1, p. 10; DNC Exhibit 3, Tab 1; DNC 5, Q. 3; DNC Exhibit 7 pp. 2-3; DNC Exhibit 8 pp. 1-2; DNC Exhibit 9 p. 2; DNC Exhibit 14, Q. 5; DNC Exhibit 16, Q. 19, 12/15/03 Tr. pp. 69-70, 76-79, 82; 1/7/04 Tr. pp. 57-59 194-95, 221-22; 01/20/04 Tr. p. 105).

28. DNC proposes to load spent fuel in phases in order to maintain full core reserve (see following table).

Millstone Power Station Projected Removal Schedule

Year	Unit 1 DSCs	Unit 2 DSCs	Unit 3 DSCs	Cumulative Total
2004-2009	0	9	0	9
2010	0	5	0	14
2013	0	4	0	18
2016	0	5	0	23
2019	0	4	3	30
2022	0	5	5	40
2025	0	4	5	49
2028	0	5	5	59
2031	0	4	2	65
2033	0	0	5	70
2036	0	0	5	75
2039	0	0	5	80
2042	0	0	5	85
Total	**0**	**45**	**40**	**85**

(DNC Exhibit 1, p. 10; DNC Exhibit 3, Tab 1; DNC 5, Q. 3; DNC Exhibit 7 pp. 2-3; DNC Exhibit 8 pp. 1-2; DNC Exhibit 9 p. 2; DNC Exhibit 14, Q. 5; DNC Exhibit 16, Q. 19, 12/15/03 Tr. pp. 69-70, 76-79, 82; 1/7/04 Tr. pp. 57-59 194-95, 221-22; 01/20/04 Tr. p. 105)

29. In the event no fuel is accepted by DOE in the next 38 years, an additional 50 HSMs beyond those required maintaining full core reserve for Units 2 and 3 could be used to satisfy an operational, regulatory or other contingency. One such contingency could be repair of a leaking spent fuel pool liner. DNC estimates 900 fuel assemblies (equals 15 DSCs) would need to be removed from Unit 1 and 400 fuel assemblies (equals 13 DSCs) would need to be removed from Units 2 or 3 to repair a liner. Therefore the total number of DSCs [15 + 15 + 13 = 41] would be needed if such a contingency occurred at each unit. (1/20/04 Tr. 5 pp. 53-55 and 106-07).

30. Originally DNC had designed the ISFSI to accommodate 234 HSMs. The 234 HSMs would have satisfied DNC's spent fuel storage requirements for operation of Units 2 and 3 through current license and license renewal and would have provided sufficient capacity for DNC to remove all of the spent fuel from the Units 1, 2 and 3 spent fuel pools. In response to concerns raised by the Town, DNC reduced the size of the ISFSI to 135 HSMs. (DNC Exhibit 16, Q. 25; 12/15/03 Tr. pp. 84-87).

31. Once the DSC with spent fuel inside is removed from the HSM, the concrete pad, HSM, and ISFSI infrastructure are not radioactive; therefore the proposed ISFSI could be dismantled and the site restored with no generation of radioactive waste, assuming acceptance of the DSC as well as the spent fuel by DOE for permanent disposal. (DNC Exhibit 16, Q. 57)

Proposed Project

32. The Millstone ISFSI would be developed pursuant to a general license issued by the NRC using a dry storage system certified by the NRC. Transnuclear's Standardized NUHOMS® (NUclear HOrizontal Modular Storage) dry storage system, which has been selected for use at Millstone, has been approved and issued a Certificate of Compliance (C of C) from the NRC. This dry storage system is NRC-certified for 20 years. (DNC Exhibit 1, pp. 9, 11-12; DNC Exhibit 5, Qs. 4 and 7; DNC Exhibit 11 at 1; DNC Exhibit 14, Q. 1)

33. Delivery of an HSM takes approximately 12 to 18 months. (01/20/04 Tr. pp.60-61)

34. DNC contractor Transnuclear has not initiated an amendment to Part 71 license to include the 32-PT (canistered Millstone fuel) as a payload for the MP-197 transport cask. (12/15/03 Tr. p. 102).

35. The Millstone ISFSI would consist of a series of reinforced concrete HSMs approximately 8'6" wide, 18'6" high (plus a 2'1" exhaust vent) and 20' long. The side, top, and back walls are four feet thick and the front wall is two feet thick are referred to as shield walls. In the center of each HSM is a hollow cylindrical sleeve within which a single welded, leak-tight, steel dry-shielded canister (DSC) is placed. (see Appendix C) (DNC Exhibit 1, p. 9, Attachment (Attach.) 5, Dwg.-10; DNC Exhibit 11 at 2; DNC DNC Exhibit 16, Q. 26; 12/15/03 Tr. pp. 51, 144-45).

36. DNC would use the most current technology of a DSC. A typical DSC is about 67 inches in diameter and between 186 inches long (see Appendix D). DSCs used for Units 2 or 3 are capable of holding 32 pressurized water reactor spent fuel assemblies (the 32PT DCS authorized by Amendment 5 to the C of C 72-1004 issued January 7, 2004. DSCs for Unit I is capable of holding 61 boiling water reactor spent fuel assemblies. (DNC Exhibit 1, p. 9; DNC Exhibit 11 at 2; DNC Exhibit 5a, p. 1.3-11; DNC Exhibit 16, Q. 26; 12/15/03 Tr. pp. 144-45; 01/20/04 Tr. pp. 34-35).

37. DNC's parent company, Dominion Resources, Inc. (Dominion), owns and operates three nuclear power stations, which are Millstone in Connecticut, and North Anna and Surry both in Virginia. Dominion is currently operating vertical storage modules at these facilities. This experience in a dry storage technology provides some operational benefit. However, not all newly approved dry storage systems would necessarily be compatible with Millstone's spent fuel. (DNC Exhibit 1, p. 3; 1/7/04 Tr. pp. 161-63; 2/19/04 Tr. pp. 217-18).

38. Dry storage is a technology currently in use at other commercial nuclear stations across the nation including North Anna and Surry nuclear power stations. This spent fuel storage alternative has been in use since 1986. The use of a dry storage installation would not require an amendment to the NRC license for any of the Millstone units. The use of dry storage would also reduce the number of times that the fuel must be handled, assuming DOE acceptance of canistered fuel. Once the spent fuel is placed in the DSCs, the spent fuel can be loaded into transportation casks, assuming license of the 32-PT as a MP-197 payload, and be taken to a federal repository. (12/15/03 Tr. p. 98).

39. Assuming a long delay in DOE acceptance, the proposed ISFSI site has been designed to accommodate a total of 135 HSMs. DNC proposes to install HSMs and load spent fuel into the ISFSI in phases in order to maintain full core reserve in accordance with prudent spent fuel management practices in Units 2 and 3 or satisfy an operational, regulatory or other contingency in Units 1, 2 and/or 3. According to the schedule (Finding of Fact No. 28) the loading of 135 HSMs would not be complete until year 2042 including a contingency to unload Unit 1 spent fuel pool equating to 50 HSMs. However, when DOE begins to accept spent nuclear fuel the total number of HSMs could be less. (DNC Exhibit 1, p. 10; DNC Exhibit 3, Tab 1; DNC Exhibit 8 at 3; 12/15/03 Tr. p. 77; 1/7/04 Tr. pp. 58, 75, 222-23).

40. The first phase of the project would involve site clearing, regrading and preparation, backfilling with "select fill" (also known as lean concrete) to address structural and seismic considerations, construction of a haul road, installation of temporary and permanent storm water drainage improvements, placement of underground utilities, movement of the perimeter Protected Area fence and the construction of a concrete pad that can accommodate the installation of 19 HSMs (Phase I). (DNC Exhibit 1, p. 10; DNC Exhibit 9 at 2; 12/15/03 Tr. p. 85; 1/7/04 Tr. p. 217).

41. No more than 19 HSMs would be installed in Phase I of the construction to cover operational needs of Unit 2 until the end of its current license. Eighteen (18) of the 19 HSMs would be used to satisfy DNC's immediate spent fuel storage requirements for Millstone Unit 2. One empty HSM (the 19th HSM) would be placed adjacent to the last loaded HSM for radiological shielding purposes. (DNC Exhibit 1, p. 10-11; DNC Exhibit 9 at 1; 12/15/03 Tr. p. 85).

42. Excess and unsuitable soils excavated during construction of the proposed ISFSI site would be transported to a soil placement area approximately 5 acres in size and located east and north of the intersection of the access road and the Amtrak rail corridor. Up to 10,000 cubic yards of material could be placed in this area for a full build out of the ISFSI. This soil would be graded and seeded for stabilization. DNC Exhibit 1, Tab 8 p. I, and Tab 9 , p. 6

Public Benefit

43. Millstone is the largest base load generator of electricity in New England and supplies enough power to supply approximately 1.2 million households. Power generated at Millstone is 28% of the installed capacity in Connecticut and provided the equivalent of 47% of Connecticut's actual generation needs between 2000 and 2002. (DNC Exhibit 8 at 2; DNC Exhibit 18; 1/7/04 Tr. p. 143).

44. During the August 14, 2003 blackout, Millstone was the only major Connecticut generator to stay online. Millstone's ability to stay online provided support to the reliability of the Connecticut power transmission grid. As a result, Millstone was credited with playing a major role in stopping the migration of the blackout throughout New England. (DNC Exhibit 8 at 2; DNC Exhibit 18).

45. Without the ISFSI, Millstone Unit 2 would lose full core reserve capability after its Spring 2005 refueling outage. Unit 3 would lose full core reserve capability in 2020. This premature closure of Millstone would impact the reliability of the electric market in the State and the region, result in the loss of jobs and have an adverse economic impact on the State, the region and the nation. (DNC Exhibit 5, Q. 3; DNC Exhibit 7 p. 2; DNC Exhibit 8 p. 1; DNC Exhibit 16, Q 19; 12/15/03 Tr. p. 76; 1/7/04 Tr. p. 57-58, 115; DNC Exhibit 18)

Proposed Site

46. The ISFSI site would be an approximately 2-acre area in the easterly portion of the South Access Point (SAP) parking lot and east of and adjacent to the Millstone power generating units (see Appendix E). Existing elevations range from 28 feet above mean sea level (AMSL) to 19 feet AMSL and slope east-southeast. (DNC Exhibit 1, Tab 5 Drawing 5 and Tab 9, p. 2; DNC Exhibit 15 addendum))

47. The westerly portion of the SAP parking lot, between the ISFSI Site and the power generating units (approximately 4 acres) would be used as an equipment laydown area. Existing elevations range from 32 feet AMSL to 22 feet AMSL and slope east-southeast. (DNC Exhibit 1, Tab 9, p. 2)

48. The ISFSI site and equipment laydown area would be surrounded by physical security measures including perimeter intrusion detection systems, physical barriers, isolation zones and security lighting similar to that currently surrounding the Millstone power generating units. Movement of the protected area fence to encompass the proposed ISFSI would be done once during construction to minimize security impacts. (DNC Exhibit 1, p. 2; DNC 9, p. 2).

49. The SAP parking lot is located directly beneath the Units 1, 2 and 3 transmission lines extending from the power generating units to the electric switchyard to the north. The ISFSI Site would be beneath the inactive Unit 1 transmission lines. The northern half of the site referred to as a "dogleg" measures approximately 300 feet long by 92 feet wide and would accommodate up to 32 HSMs in a single row. The southern half of the ISFSI site measures approximately 300 feet long by 190 feet wide and would accommodate up 35 HSMs in a single row and 34 HSMs back to back in double row which equates to 35 + 34 + 34 = 103 HSMs. The 103 HSMs + 32 HSMs = 135 HSMs as proposed. (DNC Exhibit 15 addendum; 01/20/04 Tr. p. 124)

50. Because the Office of Safety and Health Administration (OSHA) imposes certain restrictions on construction activities below energized transmission lines, activity beneath the energized Units 2 and 3 transmission lines would be limited to equipment storage in the Equipment Laydown Area. (DNC Exhibit 1, pp. 10, 29; DNC Exhibit 5, Q. 12; 12/15/03 Tr. p. 183).

51. If the construction was done in phases, additional excavation, handling of storm water and dewatering activities would have to occur. By preparing the entire infrastructure at one time, the site and the adjacent wetland and upland review area are only exposed to this activity over one construction period. ((DEP Comment Letter; 2/19/04 Tr. pp. 213-15).

52. Removing the northend of the ISFSI site, a.k.a "dogleg", would increase distance to adjacent residential area and reduce disturbance and excavation by approximately 40 percent. DNC would be amenable to a condition of approval to restrict the size of the ISFSI to the southend. The south end of the ISFSI could store 103 HSMs. (01/20/04 Tr. pp. 126-128)

Alternatives to the proposed ISFSI

53. One alternative DNC considered for managing its spent fuel storage needs was to do nothing. However, without alternative spent fuel storage, DNC believes that Unit 2 would be required to shut down in 2010 and Unit 3 might be required to shutdown prior to the end of its current license period. (DNC Exhibit 16, Q. 19; 1/20/04 Tr. p. 96).

54. DNC and its predecessor have increased the original capacity, of the Unit 2 and Unit 3 spent fuel pools via reracking of spent fuel assemblies. In 1986, Unit 2's spent fuel pool capacity was reracked from an existing 667 spent fuel assemblies to its current 1,346 spent fuel assemblies. In 2000, Unit 3's spent fuel pool capacity was reracked from an existing 756 spent fuel assemblies to its current 1,779 spent fuel assemblies. Currently, Unit 2's spent fuel pool currently has 1,088 spent fuel assemblies and Unit 3's spent fuel pool has 654 spent fuel assemblies. No additional measures are available to increase the spent fuel storage. (DNC Exhibit 7 at 1-2; DNC Exhibit 16, Q. 20).

55. DNC considered interunit transfer, as permitted by NRC regulations. Interunit transfer would involve taking the spent fuel from the Unit 2 spent fuel pool and storing it in the Unit 3 spent fuel pool. Although this would provide for some additional spent fuel storage capacity in the Unit 2 spent fuel pool, this alternative would also more quickly use the existing capacity of the Unit 3 spent fuel pool. Assuming that DOE has not begun to accept spent fuel there is not sufficient space in the Unit 3 spent fuel pool to accommodate all of the spent fuel assemblies that would be discharged during the current license periods for Units 2 and 3. As a result, interunit transfer would only delay but would not eliminate the need for the ISFSI. Interunit transfer would also require the Unit 2 fuel to be handled multiple times. (DNC Exhibit 5, Q. 8; DNC Exhibit 7 p. 2; DNC Exhibit 16, Q. 21; 12/15/03 Tr. pp. 67, 98; 1/7/04 Tr. pp. 149, 159, 160; DEP Comment Letter at 3; 12/15/03 Tr. pp. 67, 98; 1/7/04 Tr. pp. 160-61; 1/20/04 Tr. p. 96).

56. Currently, the Unit 2 and Unit 3 spent fuel pools are only permitted to accept spent fuel from their respective generating units. An NRC license amendment would be required to move the spent fuel from the Unit 2 spent fuel pool to the Unit 3 spent fuel pool. DNC did not file a license amendment. Such an amendment proceeding with the NRC is expected to take approximately 18 to 24 months excluding intervention which would add to the timing of a decision. (DNC Exhibit 5, Q. 8; DNC Exhibit 16, Q. 21, 23; 1/7/04 Tr. pp. 150-51; 02/19/04 Tr. p. 152).

57. DNC also contemplated building an additional spent fuel pool in order to accommodate the spent fuel from Units 2 and 3. There is no existing space within the current buildings at Millstone to accommodate another spent fuel pool. As a result, a separate building, with all its attendant support structures, would have to be built outside the existing Protected Area. Like inter-unit transfer, the construction of a new spent fuel pool would require the fuel to be handled multiple times. No other facility in the United States has added a spent fuel pool to an existing reactor site, and the uncertainties involved would add considerable time to the licensing process and produce a more costly alternative. (1/20/04 Tr. p. 96; 2/19/04 Tr. pp. 215-16).

58. The DEP considered alternative methods of spent fuel storage and concluded that dry storage was the preferred alternative. (DEP Comment Letter at 2-3).

59. Other spent fuel management alternatives explored were reprocessing of the spent fuel; and transshipment of the spent fuel to another location. Neither of these alternatives is currently feasible. (12/15/03 Tr. p. 122)

60. The installation of a berm around the ISFSI Site, also referred as a hardened on-site storage (HOSS) installation, would increase the overall size of the area to be developed. The applicant proposed a berm that would be approximately 92 feet wide at the base, 22 feet tall and would encroach into the designated wetland area on the property to the east of the SAP parking lot. In order to install an earthen berm, DNC would have to relocate the rail spur and the access road to the east. Because the Protected Area fence would be on the outside of the earthen berm, the fence would extend well into the wetland areas on the Property. The installation of an earthen berm would require approximately 70,000 cubic yards of fill, which could require DNC to import approximately 53,000 yards of additional fill onto the site. A smaller berm or shielding could be feasible. (01/20/04 Tr. p. 202; 2/19/04 Tr. pp. 187-88, 201).

61. The NUHOMS® System is not designed and has not been certified for burial by the NRC. (DNC Exhibit 14, Q. 12; 1/7/04 Tr. pp. 131-33).

62. Connecticut General Statute Section 22a-137 requires legislative action for an application to bury radioactive waste. (CGS Section 22a-137; 12/15/03 Tr. pp. 172-174)

Alternative Sites

63. The location for the proposed ISFSI was selected following an evaluation of possible locations both inside the existing Protected Area and elsewhere on the Property (sees Appendix B). DNC considered four locations on the Property but outside the current Protected Area. Each of these locations was evaluated based on four criteria: (a) radiological compliance; (b) physical site suitability; (c) environmental effects; and (d) security. (DNC Exhibit 1, Attach. 6; DNC Exhibit 17).

64. Although all four locations satisfied the review criteria, DNC determined that the proposed ISFSI site is the preferred location because:

- It is located closest to the existing Millstone Protected Area and would simply require an expansion of the Protected Area fence to surround the ISFSI. Each of the alternative sites would require a separate and distinct security area outside the limits of the existing Millstone Protected Area;

- It offered the shortest haul path between the Unit 2 and Unit 3 spent fuel pools and the proposed ISFSI. The entire haul path from the spent fuel pools to the ISFSI Site would be completely within the Millstone expanded Protected Area; and

- It is located approximately 1,300 feet south of the Amtrak rail line, thereby eliminating potential security issues associated with the active use of the line. The railway spur located east of the chosen site is owned by DNC and has been deactivated and secured.

(DNC Exhibit 1, Attach. 6; DNC Exhibit 17))

65. In its review of the Application, the DEP also determined that "[t]he proximity of the selected site to the generating units renders this site a more logical choice . . . ." than the alternative sites. (DEP Comment Letter at 2).

66. Alternative locations within the existing Protected Area were not feasible because: (a) there was no contiguous 2-acre area available that would allow construction of the ISFSI; (b) difficulties would be presented from a security and spent fuel storage management perspective; and (c) inability to satisfy the NRC minimum distance requirement within an owner-controlled area. (DNC Exhibit 1, Attach. 6; DNC Exhibit 9 at 1).

Land Use

67. The southerly portion of the Property (south of the Amtrak rail line), where the power generating units are located and the ISFSI is proposed to be located, is zoned I-G, General Industrial District. The portion of the Property north of the Amtrak rail line is zoned IP-1, General Industrial Park District. A small portion of property east-northeast adjacent to the residential area is zoned OS Open Space District. (DNC Exhibit 1, p. 22).

68. The primary East Coast rail corridor for Amtrak and Conrail traverses ease-west through the Millstone Power Station property and located approximately 1, 300 feet north of the proposed ISFSI. The more developed portion (Units 1, 2 and 3 and associated uses) of the property is south of this rail line and the less developed portion of property lies north of the rail line. (DNC Exhibit 1, Tab 9 p. 19)

69. The nearest residential area is located approximately 1,700 feet northeast of the ISFSI Site. Additional residential areas exist as close as approximately 2,700 feet to the northwest of the ISFSI Site. (DNC Exhibit 1, p. 24).

70. The closest recreational resource is Jordan Cove located approximately 325 feet southeast of the proposed ISFSI. Other recreational areas are those located in the northeast corner of the Property. Millstone currently allows the Town to use a portion of the Property for recreational purposes. The Town has developed baseball, soccer and football fields in this area. The use of these fields by the Town would not be affected by the ISFSI project. The existing Millstone Nature Trail is a recreational area that has been closed to the public pursuant to NRC Security Orders issued since September 11, 2001. (DNC Exhibit 1, p. 20).

Environmental, Historical, and Cultural Resources

71. The proposed development of the ISFSI would have no effect on state or federal historic or archeological resources listed on or eligible for the National Register of Historic Places. (DNC Exhibit 1, Attach. 10).

72. No extant populations of Federal or State Endangered or Threatened or Special Concern species were found at the proposed ISFSI. (DNC Exhibit 1, Attach. 12).

73. The HSM vents are covered with exterior screens to prevent animals and birds from entering the HSMs. (DNC Exhibit 16, Q. 32).

74. The relative location and height of the ISFSI are such that the use of the top surface by birds for nesting is highly unlikely. To the extent that birds perch on the ISFSI, the duration would be limited. (DNC Exhibit 16, Q. 33).

Traffic

75. Traffic would be limited to construction worker vehicle trips and trucks associated with the delivery of soil, concrete and related construction materials. (DNC Exhibit 1, p. 21).

76. Truck traffic associated with the ISFSI project would be required to use designated truck routes and adhere to Department of Transportation regulations regarding load weight. Certain materials (e.g., HSMs) are expected to be transported to the site by barge, further reducing the traffic burden on local roads. (DNC Exhibit 1, p. 21).

77. All spent fuel loading processes would occur within the expanded Protected Area. No on- or off-site traffic would be impacted by this process. (DNC Exhibit 1, p. 21).

Noise

78. Noise associated with the construction of the ISFSI would occur on-site for a short period of time, approximately three months, during the initial phases of construction. The closest off-site noise receptor is a residential area approximately 1,700 feet to the northeast of the ISFSI Site. (DNC Exhibit 1, p. 18).

79. The NUHOMS® System is a passive system for storing spent fuel. There are no operating motors, fans or other similar devices associated with the HSMs. The only noise resulting from the operation of the ISFSI is that associated with the transport and loading operation. (DNC Exhibit 1, p. 18, Attach. 9 § 4.10).

Visibility

80. The ISFSI Site would be located adjacent to the existing Millstone generating units in the southernmost portion of the Property. (DNC Exhibit 1, Attach. 11).

81. The proposed ISFSI Site could be viewed from Jordan Cove, Long Island Sound and Niantic Bay; residential property, northwest of the ISFSI Site; an area along the Amtrak right-of-way, north of the ISFSI Site; and the closest residential neighborhood, northeast of the ISFSI Site. (DNC Exhibit 1, Attach. 11).

82. From most of these locations, surrounding views of the ISFSI Site would be obstructed by changes in topography, existing vegetation (mature trees) and the existing power generating facility itself. The outline of the storage modules may be visible, through the trees, from locations to the east, southeast and northeast, but only during winter months. (DNC Exhibit 1, pp. 19-20).

Air Quality

83. During construction, the potential exists for short-term and highly localized impacts from the operation of construction equipment and vehicular movement. (DNC Exhibit 1, Attach. 9, p. 28).

84. Additional impacts to air quality, during construction, may result from fugitive dust. These impacts are expected to be contained on-site and would be limited only to the earth-moving stage of site work. Measures could be implemented to reduce the amount of dust generated during construction. (DNC Exhibit 1, Attach. 9, p. 28).

85. Upon completion of construction and assuming acceptance by DOE without inspection of DSC contents, the NUHOMS® System, which is a passive installation without moving equipment or components, would not generate any air emissions. (DNC Exhibit 12 at 2)

86. DNC proposes to use spent fuel five years of age or older to be stored in a DSC within the HSM. The principle heat removal mechanism is natural convection. Air will circulate through the front bottom vent of the HSM and pass upwards and around the HSM. Ninety percent of the heat generated is removed via convection and the remaining ten percent is removed via conduction through the concrete HSM. The maximum heat rate would be 24 kilowatts, equivalent to the heat generated by about 15 hairdryers. (DNC 11 p. 2; 12/15/03 Tr. p. 61; 01/20/04 Tr. p. 39)

Wetlands and Watercourses

87. The ISFSI Site, Equipment Laydown Area and the area in which soil would be placed during construction (Soil Placement Area) are located outside the limits of existing tidal and inland wetlands and watercourses on the Property, and outside the 500 year flood zone. (DNC Exhibit 1, pp. 14-16, Attach. 7; DEP Comment Letter at 2; 1/7/04 Tr. pp. 123-24, 154).

88. The closest wetland or watercourse is located approximately 150 feet to the east of the ISFSI Site and adjacent to a DNC-owned railroad spur. This wetland area is associated with a drainage outfall (DSN 011) and swale to the east of the existing railroad spur line. (DNC Exhibit 1, p. 15 and Attach. 7, Fig. 2; Exhibit 14, Q. 19; DNC Exhibit 15).

89. The existing drainage outfall (DSN 011), east of the railroad spur, would be replaced with a new pipe and head-wall and permanent erosion controls measures. This improvement is part of the proposed ISFISI storm water drainage plan. These impacts would be temporary but would result in long-term improvements to the existing drainage outlet. (DNC Exhibit 1, p. 15-16, Attach. 7; DNC Exhibit 12 at 2).

90. Additional wetlands have been identified to the north of Building 532 and the existing access road located about 400 feet northeast of the proposed ISFSI site. DNC proposes limited drainage improvements, south of the access road and east of Building 532. This activity is within the Town's 100-foot upland review area. (DNC Exhibit 1, pp. 15-16, Attach. 7).

91. A fresh water pond is approximately 200 feet to the east of the ISFSI Site and Jordan Cove and Long Island Sound is about 325 feet southeast of the proposed ISFSI site. (DNC Exhibit 1, pp. 15-16, Attach. 7).

92. Erosion and sedimentation controls, consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, could be installed and monitored throughout the construction period. (DNC Exhibit 1, pp. 15-16, Attach. 7).

Storm water

93. Storm water runoff from the SAP parking lot is currently conveyed as sheet flow until intercepted by several existing catch basins

Comparison of the existing and proposed peak flow runoff (cfs)
assuming full build out to 135 HSMs.

	2-year storm	10-year storm	25-year storm	100-year storm
Existing Conditions	19	33	39	53
Proposed Conditions	20	34	40	54
Change	1	1	1	1

(DNC Exhibit 1, p. 16 and Tab 8, Table 1)

94. As part of the ISFSI project certain modifications to the existing storm water drainage system would be required. These modifications include:

- the rerouting of a portion of the 30" storm water drainage line, from a point near Building 532, to run parallel to the existing access road and around the northerly and easterly side of the ISFSI Site. This new drainage line would connect to a new storm water culvert (DN 011) east of the ISFSI Site;

- the installation of new storm water drainage structures including catch basins and trench drains within the ISFSI Site and Equipment Laydown Area. Each of these drainage structures would be connected to a piping system located south of the ISFSI Site, connected to the storm water culvert (DN 011) east of the ISFSI Site;

- the replacement of the existing storm water culvert (DN 011) extending from the area east of the ISFSI Site, under the access road and rail spur; and

- the replacement of an existing outlet structure east of the railroad spur line with permanent erosion control measures.

(DNC Exhibit 1, pp. 16-17).

95. DNC currently maintains an individual National Pollution Discharge Elimination System (NPDES) permit for the discharge of storm water and plant process wastewater and a General Permit for the Discharge of Storm water Associated with Industrial Activity. The individual NPDES permit currently includes the storm water run-off from the SAP parking lot where the ISFSI is proposed to be located. Upon the completion of and prior to discharge of storm water from the ISFSI, DNC would confirm or obtain coverage under its NPDES permit or register DSN 011 under the DEP's General Permit for the Discharge of Storm water Associated with Industrial Activity. (DNC Exhibit 1, p. 16 and Attach. 8; DNC Exhibit 5, Q. 14; DNC Exhibit 12 at 2 and 3

96. No storm water drainage improvements are proposed or necessary in the Soil Placement Area. (DNC Exhibit 1, p. 17).

Groundwater

97. The depth to groundwater at the ISFSI Site is 6.5 - 14 feet below surface, and most of the overburden material is very dense with low permeability. (12/15/03 Tr. pp. 164-66).

98. DNC intends to complete all subsurface work and install associated infrastructure to prepare the ISFSI site for 135 HSMs during the initial construction phase rather than perform the subsurface work in phases. This approach would minimize potential construction impacts on groundwater. (DNC Exhibit 9 at 2; DNC Exhibit 16, Q. 54).

99. If the ISFSI is built out beyond the first 19 HSMs, only the four (4) foot thick concrete pads would be added. These pads would not come in contact with nor adversely affect groundwater. (DNC Exhibit 9 at 2; DNC Exhibit 16, Q. 54).

100. Both HSM and Apron storm water runoff would be collected and discharged through the storm water outlet (DN 011) to the east of the SAP parking lot and the railroad spur. (DNC Exhibit 1, Attach. 5, DWG-4 & DWG-5; DNC Exhibit 16, Q. 54).

Schedule and Cost

101. DNC would commence Phase I immediately following the Council's approval of the Development & Management Plan and full construction of Phase I is anticipated to be completed by the end of 2004. Nineteen (19) HSMs would be installed in Phase I. (DNC Exhibit 1, pp. 10 and 32; DNC Exhibit 9 at 1; 12/15/03 Tr. p. 85).

102. DNC estimates that the cost of construction of Phase I of the ISFSI project would be approximately $24 million and that the costs associated with the full build-out, if necessary, would be an additional approximately $95 million. (DNC Exhibit 1, p. 32).

103. The ISFSI is an alternative method of storing spent fuel incidental to and in support of Millstone's existing power generating operations and, while there is some uncertainty concerning whether the DOE contract includes any extra costs associated with the removal of canister fuel, it would not change the principal use of the Millstone property. (DNC Exhibit 1, p. 8; DNC Exhibit 7 at 2-3).

Security

104. DNC has security measures in place pursuant to NRC regulations. Since the event on September 11, 2001, the NRC evaluated and placed additional orders to general licensees to increase on-site security, especially those reactor sites with dry storage installations. DNC and the State of Connecticut, including DEP, coordinate response and/or recovery scenarios. (DNC Exhibit 1, p. 22, 1/20/04 p. 23)

105. The Office of Emergency Management has a primary role as an agency that deals with response and/or recovery from any state-wide event. The Division of Homeland Security looks at more of a global perspective of prevention, protection, deterrents, along with preparedness, response, and recovery. (1/20/04 Tr. pp. 10 and 11)

Municipal Orders

106. As part of the local input process, the Town of Waterford Planning and Zoning Commission (P&Z Commission) and Town of Waterford Conservation Commission (Conservation Commission) issued regulate and restrict orders pursuant to General Statutes § 16-50x(d). The P&Z Commission ordered "The proposal and extension of the protected area shall be reduced and restricted to that area required to accommodate phase one of the proposal, temporary dry cask storage of up to 18 modules (additionally one unfilled module), for the reason that this quantity has been determined to be necessary for the continued operation of Unit 2 through its current license period and is considered acceptable subject to the following restrictions:

    1. The designated and acceptable location for the storage of spent fuel is the existing spent fuel pools. The permanent storage facility is not on this site.

    2. The need for temporary storage will maintain capability of full reactor off load into the spent fuel pool for unit 2

    3. Temporary dry cask storage will be removed from the site prior to or as part of the plant decommissioning.

    4. Temporary dry cask storage is not needed to accommodate spent fuel from Unit 1 or 3.

    5. Temporary dry cask storage will be restricted to waste generated on site.

    6. This temporary use will not preclude the future use of the facility for business, water dependent or industrial use(s) as permitted in the Zoning Regulations of the Town of Waterford.

    7. No other physical improvements or outdoor use of land will be required to move the dry cask units onto the site. Any such improvements subsequently identified shall be submitted for commission review.

    8. As has been customary when regulating waste storage on this site, the commission requires a written report at intervals of not less than five years on the status of construction, module installation, continued need, changes in plans for off site disposal and other information that would keep the commission informed on changes impacting the duration of the storage.

    9. Incorporated by reference is a letter dated August 15, 2003 from the Waterford Conservation Commission to Paul B. Eccard, First Selectman and the application material filled with the Planning and Zoning Commission."

    DNC Exhibit 1, Tab 13; DNC Exhibit 3, Attach. 3)

107. The Town of Waterford Conservation Commission states:

- that the size of the ISFSI "should be minimized in number required to meet DNC's intent to maintain full core off-load capacity of Unit Two for the interim period until the anticipated operational date of the federal repository at Yucca Mountain in 2010."

- that "a good faith and detailed examination of alternatives to the current storage proposal that were considered and rejected" including a "summary of the financial options analysis conducted by Dominion on each of the alternatives."

- That "the size of the concrete pad and expanded security area be restricted to that area necessary to store 10 modules by 2005 and 19 total modules by 2013."

- that "the location of the HSM modules on the selected ISFSI site should be restricted to the western edge of the proposed pad proximal to the existing structure and the existing perimeter security fence."

- that the spent fuel stored in the ISFSI should be restricted to the spent fuel from Unit 2 "currently identified for acceptance at the federal repository and consistent with the acceptance priority ranking prepared by the U.S. Department of Energy."

- that "a groundwater and surface water monitoring plan should be prepared and implemented" at the ISFSI Site with results submitted to the Town of Waterford.

- that additional monitoring of the proposed ISFSI be presented for Town review and comment and detailed information of the method of delivery of the HSMs be provided for review.

(DNC Exhibit 3, Attach. 3, Condition 9).

Applicant's Appeal and Acceptable Conditions

108. On September 19, 2003, DNC appealed the Municipal Orders to the Council related to the use of the ISFSI, the future use of the Property, reporting obligations, the location and size of the ISFSI and the physical improvements required for construction and installation of the ISFSI. (DNC Exhibit 1, pp. 26-31; DNC Exhibit 4).

109. As part of this proceeding, DNC agreed to several conditions of approval. These conditions are:

- Only Millstone spent nuclear fuel would be stored in the ISFSI.
- DNC would use only NRC-certified dry storage systems as part of the ISFSI.
- DNC would provide the Council and the Town with annual reports on the status of Millstone's operations, including information on the necessity to expand the ISFSI, the status of the federal repository and a 5-year projection of DNC's anticipated spent fuel storage requirements
- DNC would install three groundwater monitoring wells, one up gradient and two down gradient from the ISFSI Site, and periodically share monitoring results with the Council and the Town.
- DNC would construct the Phase I site improvements as follows:
    - Complete all subsurface infrastructure work, including without limitation, site clearing, regrading and preparation, backfilling with "select fill" (also known as lean concrete) to address structural and seismic considerations, construction of a haul road, installation of temporary and permanent storm water drainage improvements and placement of underground utilities;
    - Relocate the perimeter Protected Area fence one time, upon completion of the Phase I site improvements, to surround the entire 2-acre ISFSI Site and 4-acre Equipment Laydown Area; and
    - Install a concrete pad large enough to accommodate 20 HSMs; install 19 HSMs on the pad; and load 18 HSMs by 2015, the end of the current license period for Unit 2.

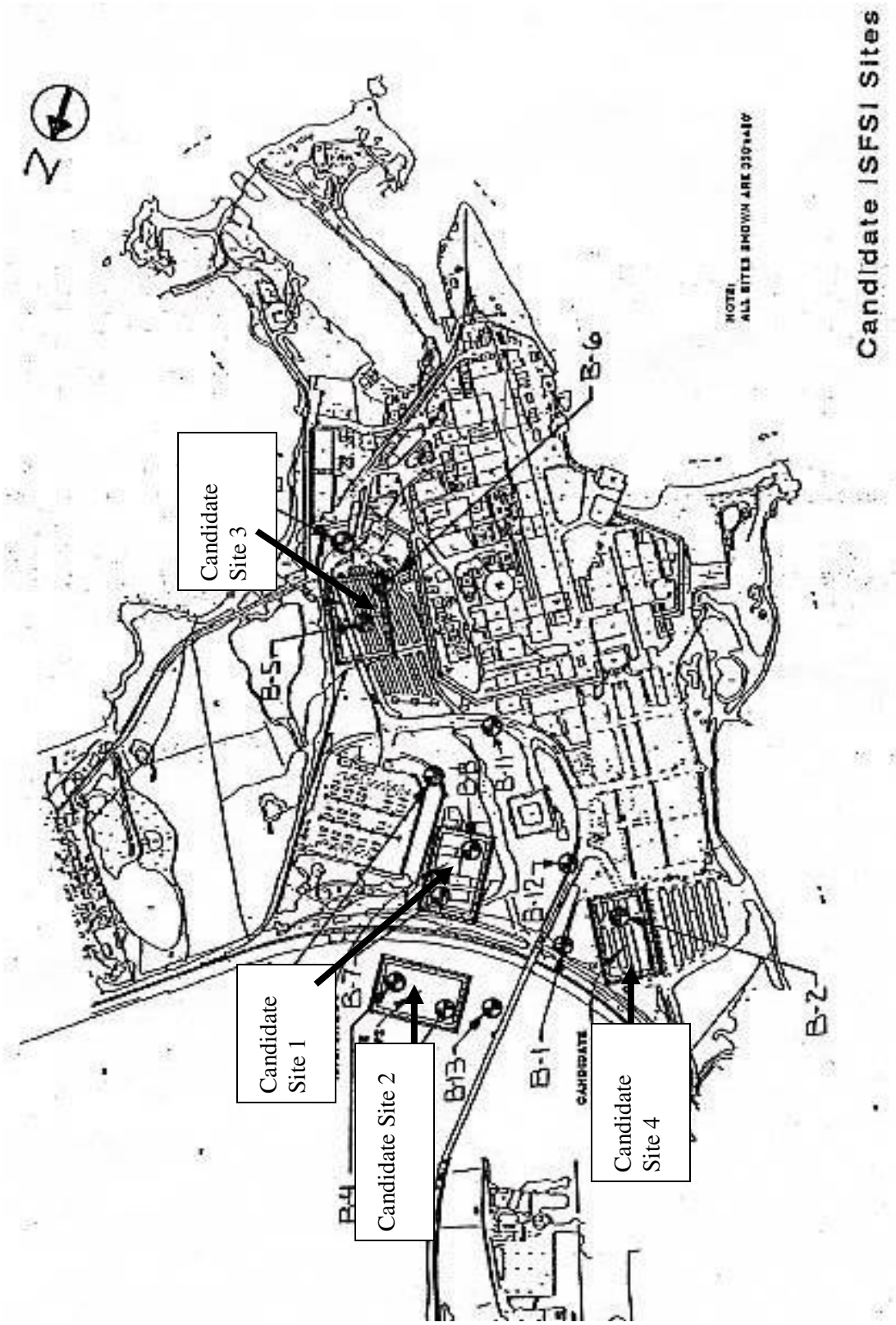
(DNC Exhibit 1, pp. 8, 11-12, 28; DNC Exhibit 5, Q. 7; DNC Exhibit 8 pp. 3-4; DNC Exhibit 9 pp. 1-2; DNC Exhibit 14, Q. 17; 12/15/03 Tr. pp. 85, 116-17; 1/7/04 Tr. p. 217; 1/20/04 Tr. pp. 118-19; DEP Comment Letter p. 3;;).

Appendix A

Millstone Power Station Location

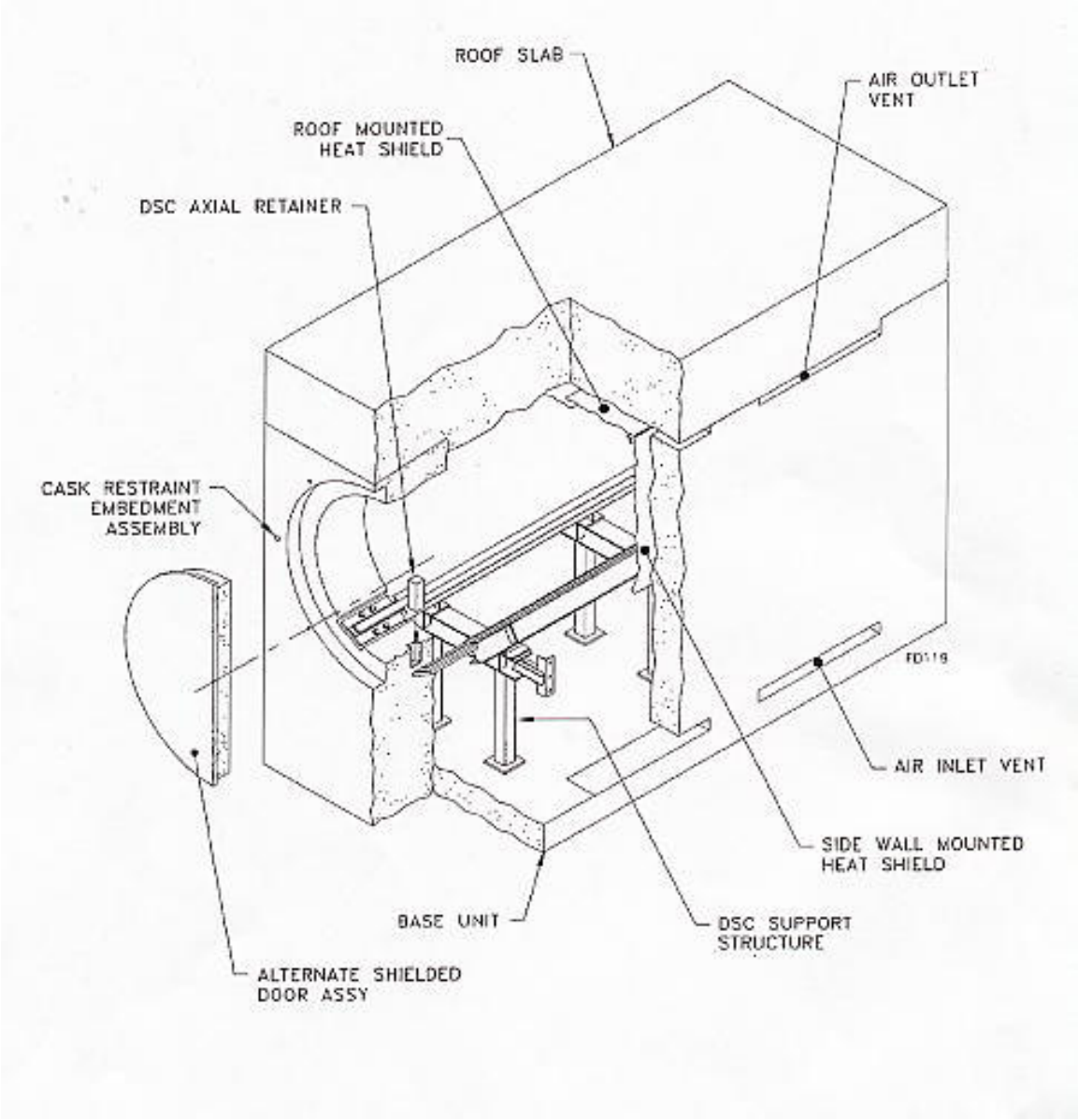
Appendix B

Proposed Alternative ISFSI sites



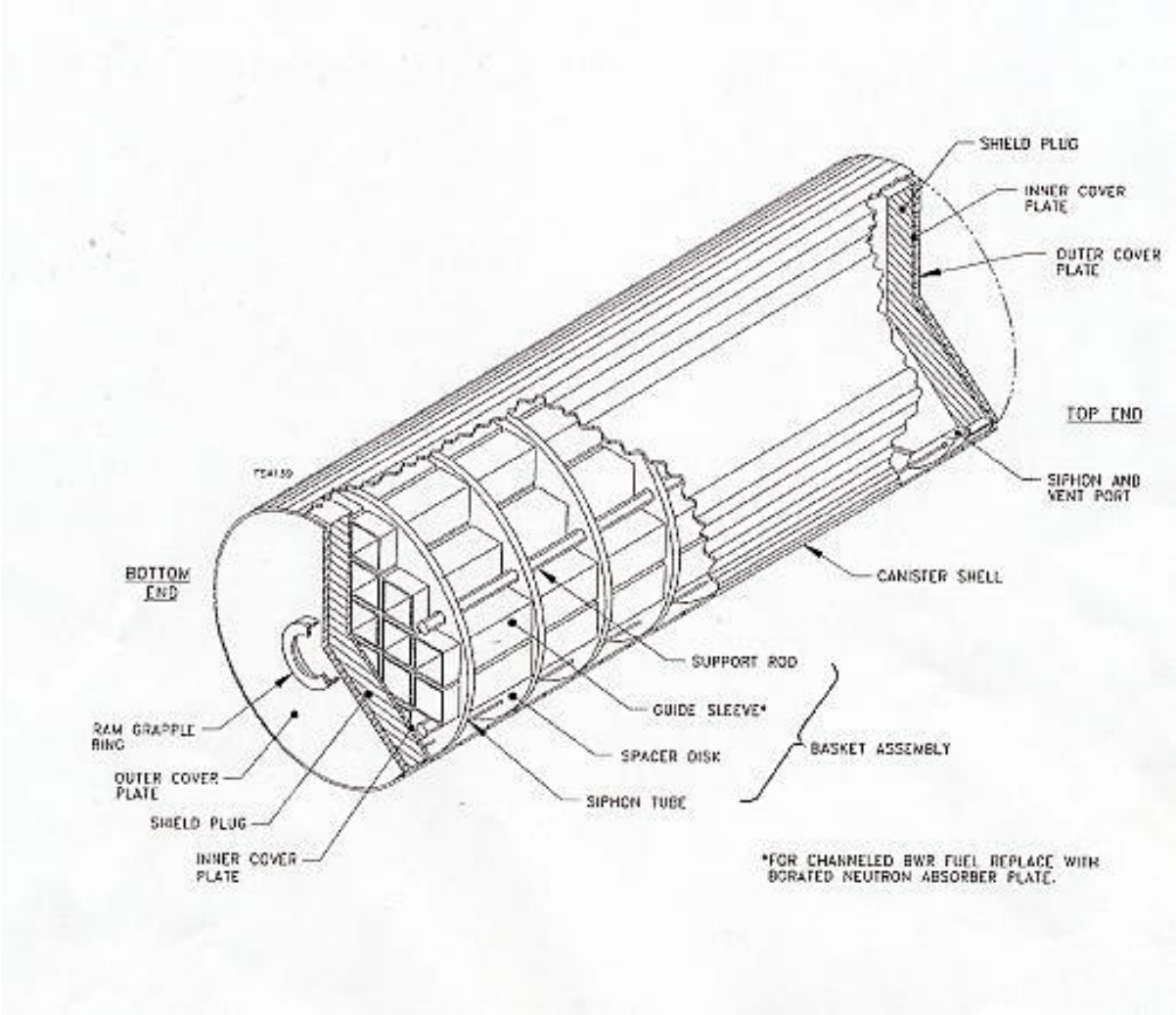
Appendix C

Horizontal Storage Module



Appendix D

Dry-shield Canister



Appendix E

Proposed ISFSI Site