Tables

Table 5.1-1: Equipment Used For Cape Wind Project Geophysical/Hydrographic Surveys

Equipment	Equipment Function
Trimble 4000 Differential Global Positioning System (DGPS) interfaced with OSI's PC-based navigation and data logging software package "Maretrack II"	Satellite positioning system which tracks up to eight satellites at a time, and applies position correction factors relayed to it from a similar shore based system (occupying a known survey point) to provide reliable, high precision (+/- 1 meter) positioning. The system outputs position fixes at a rate of 1 per second to an onboard navigation and data-logging computer which allows the survey vessel helmsman to accurately navigate the vessel along preselected survey tracklines throughout the area investigated.
Innerspace Model 448 digital depth sounder	Microprocessor controlled, high resolution, survey-grade depth sounder that operates at a frequency of 208 kHz, providing precise water depth measurements.
DataSonics SIS-1500 Digital Side Scan Sonar system	Side looking sonar, which transmits and receives acoustic signals from transducers mounted on an underwater transducer that is towed by the survey vessel. The output from the side scan sonar is essentially analogous to a high angle oblique "photograph" providing detailed representations of bottom features and characteristics.
Geometrics Model G-881 Cesium Marine Magnetometer	Marine magnetometer designed to detect metal objects buried beneath or lying on the seabed. The magnetometer, which acquires information on the ambient magnetic field strength by measuring the variation in cesium electron energy level states, is towed via underwater sensor aft of the survey vessel. As the sensor passes near objects containing ferrous metal a fluctuation/disturbance in the earth's magnetic field is detected. This fluctuation is measured in gammas and is proportional to the amount of metal contained in the sensed object.
2002: OSI 300-joule high resolution Boomer subbottom profiling system *2003*: Applied Acoustics CSP 300 Boomer subbottom profliling system	Subsurface profiler that generates a high-energy acoustic pulse in the water column in the range of 400 Hz. - 8 kHz. The signal generated by the system propagates downward to the seabed where it is partially reflected at the water-sediment interface. The balance of this signal continues into the bottom and is partially reflected at each successive subsurface interface, e.g., changes in sediment characteristics, rock surfaces, etc.
Geo-Star Full Spectrum Chirp Sub-bottom Profiler	High-resolution subsurface profiler which uses wide band Frequency Modulation (FM) pulses to detect and measure the depth to reflecting horizons in the near subsurface. The system tends to provide better shallow resolution than the lower frequency, higher energy Boomer (see above) profiling system, but typically will not penetrate to the deeper subsurface reflectors that the Boomer system is capable of reaching.

From OSI, July 25, 2002 & OSI, November 20, 2003

Table 5.1-2: Summary of Marine Vibracore Information for the Cape Wind Project

Core Penetration Depth (ft)	Core Recovery (ft)	Core Collection Date	Benthic Grab (date)	Physical Analysis Submitted	Chemical Analysis Submitted	Unified Soil Classification Field	Comments
10	10	8/2/2001	8/4/2001	YES	NO	SP,SM	Popponosset Cable Route
10.1	10.1	8/2/2001	8/4/2001	YES	S1(0-5'), S2(5'-10.1')	CH,SP,ML	Popponosset Cable Route
10.2	10.2	8/2/2001	8/4/2001	YES	NO	SP,SW	optional, Popponosset Cable Route
10	9	8/2/2001	8/4/2001	YES	NO	SP	optional, Popponosset Cable Route
10	9.6	8/2/2001	8/4/2001	YES	NO	SP,SW	Cotuit Cable Route
10	8.8	8/2/2001	8/4/2001	YES	NO	SW	Cotuit Cable Route
10	9.2	7/31/2001	8/4/2001	YES	NO	SP,GM	Cotuit Cable Route
10	9.3	8/16/2001	8/16/2001	YES	NO	SP,SW,SM	Cotuit Cable Route
10	9.8	7/31/2001	8/4/2001	YES	NO	SP,SM	Yarmouth Cable Route
9.9	8.1	8/16/2001	8/16/2001	YES	S2(5'-8.1')	SW,SC,CL	Yarmouth Cable Route
8	7.8	8/17/2001	8/17/2001	YES	S1(0-5'),S2(5-7.8')	OL,SM	Popponosset Bay Cable Route
10	9.7	8/17/2001	8/17/2001	YES	NO	SW	Popponosset Bay Cable Route
10.3	9.9	8/17/2001	8/17/2001	YES	NO	SW,SM	Lewis Bay Cable Route
10	8.8	8/16/2001	8/16/2001	YES	NO	SP,SW	Lewis Bay Cable Route
10	8	7/31/2001	8/4/2001	YES	S1(0-5')	SW,SP	Popponosset Cable Route
10	8.7	7/31/2001	8/4/2001	YES	S1(0-5')	SP	Cotuit Cable Route
10	9.5	7/31/2001	8/4/2001	YES	S1(0-5'),S2(5'-9.5')	SP,CH,SW	Yarmouth Cable Route
10	9.7	8/17/2001	8/17/2001	YES	S1(0-5'),S2(5'-7.7')	OL	Popponosset Bay Cable Route
10	8.5	8/17/2001	8/17/2001	YES	NO	SW,SM	Popponosset Bay Cable Route
10	10.1	8/18/2001	8/18/2001	YES	S1(0-5'),S2(5'-10.1')	ML,OL,SM	Lewis Bay Cable Route
10	8.8	8/18/2001	8/18/2001	YES	NO	SP,SW	Lewis Bay Cable Route
10	8	8/2/2001	8/4/2001	YES	S1(0-5')	SP,SM	Popponosset Cable Route
10	8.7	7/31/2001	7/31/2001	YES	S1(0-5')	SP,SW	Cotuit Cable Route
10	8.5	7/31/2001	8/4/2001	YES	S1(0-5')	SP,SW	Yarmouth Cable Route
10	9.5	7/31/2001	8/4/2001	YES	S1(0-5')	SP,SW	Yarmouth Cable Route
15	12.3	8/6/2001	8/6/2001	YES	NO	SP	Cotuit Cable Route
19.5	18.7	8/16/2001	8/16/2001	YES	S1(0-5')	SM,SW,ML	Cotuit Cable Route
15.2	13.8	8/12/2001	8/12/2001	YES	NO	SP	Yarmouth Cable Route
16.5	11.1	8/15/2001	8/15/2001	YES	NO	SP,SW	Yarmouth Cable Route
15.5	12.3	8/12/2001	8/12/2001	YES	NO	SW,SP,MH	Yarmouth Cable Route
19	19.2	8/13/2001	8/13/2001	YES	S2(10'-19.2')	SW,SP	Horseshoe Shoal WTG Grid Area
18	17.8	8/15/2001	8/15/2001	YES	NO	SW	Horseshoe Shoal WTG Grid Area
17	16.6	8/12/2001	8/12/2001	YES	S1(0-10')	SP,PT,SM	Horseshoe Shoal WTG Grid Area
20	20	8/11/2001	8/11/2001	YES	NO	SP	Horseshoe Shoal WTG Grid Area
20	16.9	8/1/2001	8/1/2001	YES	NO	SP,CL	Horseshoe Shoal WTG Grid Area
20	22.1	8/5/2001	8/5/2001	YES	NO	SW	Horseshoe Shoal WTG Grid Area
11.5	13.2	8/8/2001	8/8/2001	YES	NO	SW	Horseshoe Shoal WTG Grid Area
20	21.5	8/6/2001	8/6/2001	YES	NO	SP,ML	Horseshoe Shoal WTG Grid Area
19.5	15.7	8/8/2001	8/8/2001	YES	S1(0-10')	SP,SM,OL	Horseshoe Shoal WTG Grid Area

Core Penetration Depth (ft)	Core Recovery (ft)	Core Collection Date	Benthic Grab (date)	Physical Analysis Submitted	Chemical Analysis Submitted	Unified Soil Classification Field	Comments
18.5	15.9	8/8/2001	8/8/2001	YES	NO	SM,SP	Horseshoe Shoal WTG Grid Area
19	20.2	8/13/2001	8/13/2001	YES	NO	SW,SM	Horseshoe Shoal WTG Grid Area
18.5	15	8/13/2001	8/13/2001	YES	NO	SP	Service Platform
20	22.1	8/13/2001	8/13/2001	YES	S1(0-10')	SW,SP	Horseshoe Shoal WTG Grid Area
15.3	14.3	8/9/2001	8/9/2001	YES	S1(0-10')	SP,SM	Horseshoe Shoal WTG Grid Area
20	16	8/9/2001	8/9/2001	YES	S1(0-10')	SW	Horseshoe Shoal WTG Grid Area
15.3	15.3	8/5/2001	8/5/2001	YES	S1(0-10')	SP	MET Tower
11	9.5	10/14/2003	--	NO	NO	SP, SM, SW	Proposed Grid Area
14.6	9.6	10/19/2003	--	NO	NO	SW, SP	Proposed Grid Area
13.3	10.8	10/14/2003	--	NO	NO	SM, SP, SW	Proposed Grid Area
15	13.3	10/19/2003	--	NO	NO	OL, SM, ML, OH	Proposed WTG H9
15	14.1	10/19/2003	--	NO	NO	SP, SM, SW, OH, ML, CH, CL	Proposed WTG I4
7.7	8.1	10/14/2003	--	NO	NO	SM, SP	Proposed Grid Area
7.8	6.5	10/14/2003	--	NO	NO	SW, ML, SP	Proposed Grid Area
10	3.3	10/18/2003	--	NO	NO	SW	Proposed WTG C9
14.8	13.3	10/19/2003	--	NO	NO	SM, SW	Proposed WTG F3
7.5	6.3	10/10/2003	--	YES	NO	SP	Proposed Cable Route
10	9.3	10/10/2003	--	YES	NO	SP-SM	Proposed Cable Route
10	10	10/10/2003	--	YES	NO	SP	Proposed Cable Route
10	9.8	10/18/2003	--	YES	S1(0-5'), S2(5-9.8')	SM-SP	Proposed Cable Route
10	9.8	10/10/2003	--	YES	NO	SP	Proposed Cable Route
10	9.8	10/10/2003	--	YES	NO	SP	Proposed Cable Route
10	9.8	10/18/2003	--	YES	NO	SP	Proposed Cable Route
9.2	8.9	10/10/2003	--	YES	NO	SP	Proposed Cable Route
10	10	10/18/2003	--	YES	NO	SP	Proposed Cable Route
10	9.8	10/20/2003	--	YES	S1(0-5'), S2(5-9.8')	CH	Proposed Cable Route
10	8	10/20/2003	--	YES	S1(0-5.2'), S2(5.2-8')	SP, SC	Proposed Cable Route
10	9.7	10/20/2003	--	YES	NO	SP, SM	Proposed Cable Route
10	7.8	10/20/2003	--	YES	S1(0-5'), S2(5-7.8')	SP, SC	Proposed Cable Route
10	9.9	10/20/2003	--	YES	NO	SP, SC	Proposed Cable Route

SM Silty Sand OL Organic Silt SP Poorly Graded Sand PT Peat SC Clayey Sand GM Silty Gravel SW Well-graded sand with gravel

Table 5.1-3: Cape Wind Project Bulk Physical Analysis Results and Sediment Classification Marine Vibracore Samples Collected During 2001 (VC01 Series) and 2003 (VC03 Series) Field Programs

Sample No.	Laboratory Visual Descriptions	ASTM Classification Group Symbol	Gradation Analysis (ASTM D422)			ASTM D2974	ASTM D2974		Atterberg Limits (ASTM D4318)		
			Percent Passing No.4 (%)	Percent Passing No.200 (%)	Hydrometer	Moisture Content (%)	Ash Content (%)	Organic Content (%)	Liquid Limit (LL)	Plastic limit (PL)	Plasticity Index (PI)
VC01C1-S1	Wet, dark brownish grey sand	SP	99	4	--	15.4	99.5	0.5	NON-PLASTIC		
VC01C1-S2	Wet, light brownsih grey sand	SP	100	1	--	16.4	99.8	0.2	NON-PLASTIC		
VC01C2-S1	Moist, brownish grey sand	SP	100	0	--	9.4	99.8	0.2	NON-PLASTIC		
VC01C2-S2	Wet, grey sand	SP	99	1	--	16.7	99.2	0.8	NON-PLASTIC		
VC01C3-S1	Wet, grey sand	SP	98	4	--	17.7	99.6	0.4	NON-PLASTIC		
VC01C3-S2	Wet, grey sand	SP	100	5	--	17.5	99.7	0.3	NON-PLASTIC		
VC01C4-S1	Wet, grey sand with gravel	SP	59	1	--	12.2	99.8	0.2	NON-PLASTIC		
VC01C4-S2	Wet, grey silty sand	SM	100	14	X	11.9	99.6	0.4	NON-PLASTIC		
VC01C5-S1	Wet, very dark greyish brown sand	SP	100	1	--	17.4	99.7	0.3	NON-PLASTIC		
VC01C5-S2	Wet, dark greyish brown sand	SP	99	3	--	20.4	99.6	0.4	NON-PLASTIC		
VC01C6-S1	Wet, olive grey sand	SP	100	1	--	12.8	99.7	0.3	NON-PLASTIC		
VC01C6-S2	Wet, grey sand	SP	100	3	--	17.8	99.8	0.2	NON-PLASTIC		
VC01C6-S3	Moist, dark grey sand	SP	100	1	--	21.6	99.6	0.4	NON-PLASTIC		
VC01C7-S1	Moist, dark brown clayey sand	SC	98	21	X	30.0	98.3	1.7	67.5	24.3	43.2
VC01C7-S2	Wet, dark greyish brown silty sand	SM	100	21	X	21.0	99.3	0.7	NON-PLASTIC		
VC01C7-S3	Wet, olive yellow silty sand	SM	99	28	X	19.1	99.7	0.3	NON-PLASTIC		
VC01C8-S1	Wet, dark grey sand	SP	99	1	--	16.6	99.7	0.3	NON-PLASTIC		
VC01C8-S2	Wet, olive brown sand with silt	SP-SM	96	6	--	18.4	99.7	0.3	NON-PLASTIC		
VC01D1-S1	Wet, black silt	ML	99	91	X	20.6	99.0	1.0	NON-PLASTIC		
VC01G1-S1	Moist, olive grey sand	SP	100	3	--	16.5	99.9	0.1	NON-PLASTIC		
VC01G1-S2	Moist, olive grey sand with silt	SP-SM	100	9	--	18.6	99.8	0.2	NON-PLASTIC		
VC01G2-S1	Wet, grey sand	SP	98	2	--	20.8	99.5	0.5	NON-PLASTIC		

Sample No.	Laboratory Visual Descriptions	ASTM Classification Group Symbol	Gradation Analysis (ASTM D422)			ASTM D2974	ASTM D2974		Atterberg Limits (ASTM D4318)		
			Percent Passing No.4 (%)	Percent Passing No.200 (%)	Hydrometer	Moisture Content (%)	Ash Content (%)	Organic Content (%)	Liquid Limit (LL)	Plastic limit (PL)	Plasticity Index (PI)
VC01G2-S2	Wet, light greyish brown sand	SP	100	1	--	18.7	99.3	0.7	NON-PLASTIC		
VC01G3-S1	Moist, grey sand	SP	100	2	--	15.7	99.8	0.2	NON-PLASTIC		
VC01G3-S2	Moist, grey sand	SP	100	4	--	15.0	99.9	0.1	NON-PLASTIC		
VC01G4-S1	Moist, dark olive sand with silt	SP-SM	100	7	--	27.1	98.7	1.3	NON-PLASTIC		
VC01G4-S2	Moist, dark olive sand	SP	100	1	--	22.9	98.4	1.6	NON-PLASTIC		
VC01G5-S1	Moist, olive grey sand	SP	100	1	--	15.7	99.7	0.3	NON-PLASTIC		
VC01G5-S2	Moist, light olive grey sand	SP	100	2	--	17.0	99.8	0.2	NON-PLASTIC		
VC01G6-S1	Moist, olive sand	SP	100	1	--	15.1	99.8	0.2	NON-PLASTIC		
VC01G6-S2	Moist, olive silty sand	SM	100	21	X	18.4	99.9	0.1	NON-PLASTIC		
VC01G7-S1	Wet, dark grayish brown silty sand	SM	90	17	X	23.0	99.1	0.9	NON-PLASTIC		
VC01G7-S2	Wet, dark grayish brown sand with silt	SP-SM	99	6	--	18.5	99.2	0.8	NON-PLASTIC		
VC01G8-S1	Moist, grey sand	SP	100	2	--	16.2	99.8	0.2	NON-PLASTIC		
VC01G8-S2	Moist, grey sand	SP	100	3	--	18.2	99.6	0.4	NON-PLASTIC		
VC01G9-S1	Moist, light grey sand	SP	99	1	--	8.6	99.9	0.1	NON-PLASTIC		
VC01G9-S2	Wet, grey sand	SP	100	3	--	19.3	99.6	0.4	NON-PLASTIC		
VC01G10-S1	Moist, grey sand with silt	SP-SM	100	6	--	17.9	99.4	0.6	NON-PLASTIC		
VC01G10-S2	Moist, grey sand with silt	SP-SM	100	9	--	15.6	99.5	0.5	NON-PLASTIC		
VC01G11-S1	Moist, dark grey silty sand	SM	98	15	X	38.1	97.3	2.7	42.1	26.1	16.0
VC01G11-S2	Moist, light grey sand	SP	100	1	--	10.8	99.7	0.3	NON-PLASTIC		
VC01G12-S1	Moist, yellowish brown sand with silt	SP-SM	100	5	--	17.7	99.7	0.3	NON-PLASTIC		
VC01G12-S2	Wet, light brown sand	SP	100	3	--	16.6	99.8	0.2	NON-PLASTIC		
VC01G13-S1	Wet, light yellowish brown sand	SP	99	2	--	13.3	99.8	0.2	NON-PLASTIC		
VC01G13-S2	Moist, light yellowish brown sand	SP	98	2	--	14.4	99.7	0.3	NON-PLASTIC		
VC01G14-S1	Moist, grey sand	SP	95	5	--	11.1	99.8	0.2	NON-PLASTIC		

Sample No.	Laboratory Visual Descriptions	ASTM Classification Group Symbol	Gradation Analysis (ASTM D422)			ASTM D2974	ASTM D2974		Atterberg Limits (ASTM D4318)		
			Percent Passing No.4 (%)	Percent Passing No.200 (%)	Hydrometer	Moisture Content (%)	Ash Content (%)	Organic Content (%)	Liquid Limit (LL)	Plastic limit (PL)	Plasticity Index (PI)
VC01G14-S2	Moist, grey sand	SP	100	3	--	15.6	99.7	0.3	NON-PLASTIC		
VC01L1-S1	Moist, black clayey sand	SC	100	14	X	21.5	98.1	1.9	32.7	19.0	13.7
VC01L1-S2	Wet, black sand with silt and gravel	SP-SM	83	8	--	19.3	98.6	1.4	NON-PLASTIC		
VC01L2-S1	Wet, grey sand	SP	100	5	--	17.9	98.1	1.9	NON-PLASTIC		
VC01L2-S2	Wet, grey sand	SP	98	4	--	24.2	97.6	2.4	NON-PLASTIC		
VC01L3-S1	Wet, grey sand	SP-SM	99	5	--	19.6	97.2	2.8	NON-PLASTIC		
VC01L3-S2	Moist, dark brownish gray silty sand	SM	99	36	X	42.1	96.8	3.2	38.6	37.1	1.5
VC01L4-S1	Wet, dark grey sand	SP	100	2	--	21.4	99.3	0.7	NON-PLASTIC		
VC01L4-S2	Wet, dark grey sand	SP	100	4	--	19.6	99.4	0.6	NON-PLASTIC		
VC01MT1-S1	Moist, light grey sand	SP	100	0	--	13.4	99.8	0.2	NON-PLASTIC		
VC01MT1-S2	Moist, light grey sand	SP	100	1	--	18.2	99.9	0.1	NON-PLASTIC		
VC01P1-S1	Wet, light brownish grey sand	SP	97	1	--	14.1	99.8	0.2	NON-PLASTIC		
VC01P1-S2	Moist, dark grey sand	SP	99	2	--	14.8	99.7	0.3	NON-PLASTIC		
VC01P2-S1	Moist, light grey sand	SP	99	1	--	13.5	99.2	0.8	NON-PLASTIC		
VC01P2-S2	Wet, very dark brown sand	SP	97	3	--	21.7	99.3	0.7	NON-PLASTIC		
VC01P3-S1	Wet, olive sand with silt	SP-SM	99	9	--	20.4	99.0	1.0	NON-PLASTIC		
VC01P3-S2	Moist, light grey sand with silt	SP-SM	100	9	--	27.5	98.9	1.1	NON-PLASTIC		
VC01P4-S1	Moist, dark grey silty sand	SM	96	24	X	24.2	99.1	0.9	NON-PLASTIC		
VC01P4-S2	Wet, olive silt	ML	100	92	X	25.5	99.1	0.9	36.6	25.9	10.7
VC01P8-S1	Wet, light grey sand	SP	99	1	--	15.7	99.7	0.3	NON-PLASTIC		
VC01P8-S2	Wet, olive grey sand	SP	99	1	--	18.8	99.8	0.2	NON-PLASTIC		
VC01P9-S1	Moist, light grey sand	SP	94	3	--	14.6	98.3	1.7	NON-PLASTIC		
VC01P9-S2	Moist, light grey sand	SP	100	2	--	13.7	99.0	1.0	NON-PLASTIC		
VC01PB1-S1	Wet, dark grey silt	MH	100	94	X	22.5	97.0	3.0	122.4	55.9	66.5
VC01PB1-S2	Wet, dark grey clay	CH	100	91	X	20.4	98.4	1.6	106.7	43.3	63.4

Sample No.	Laboratory Visual Descriptions	ASTM Classification Group Symbol	Gradation Analysis (ASTM D422)			ASTM D2974	ASTM D2974		Atterberg Limits (ASTM D4318)		
			Percent Passing No.4 (%)	Percent Passing No.200 (%)	Hydrometer	Moisture Content (%)	Ash Content (%)	Organic Content (%)	Liquid Limit (LL)	Plastic limit (PL)	Plasticity Index (PI)
VC01PB2-S1	Moist, dark brown clay with sand	CH	100	83	X	56.6	71.4	28.6	90.8	25.8	65.0
VC01PB2-S2	Moist, dark brown silty sand	SM	99	38	X	58.3	96.7	3.3	NON-PLASTIC		
VC01PB3-S1	Wet, grayish brown sand	SP	98	4	--	18.6	99.5	0.5	NON-PLASTIC		
VC01PB3-S2	Wet, dark grey sand	SP	91	3	--	15.6	99.5	0.5	NON-PLASTIC		
VC01PB4-S1	Wet, olive grey sand	SP	98	1	--	14.3	99.8	0.2	NON-PLASTIC		
VC01PB4-S2	Moist, grayish brown sand	SP	95	3	--	7.6	99.8	0.2	NON-PLASTIC		
VC01SP1-S1	Moist, brown sand	SP	100	1	--	15.2	99.7	0.3	NON-PLASTIC		
VC01SP1-S2	Moist, brown sand	SP	100	0	--	15.7	99.9	0.1	NON-PLASTIC		
VC01Y1-S1	Wet, grayish brown sand	SP	99	1	--	15.8	100.0	0.0	NON-PLASTIC		
VC01Y1-S2	Moist, dark yelloish brown clayey sand	SC	97	45	X	19.8	99.5	0.5	37.4	24.1	13.4
VC01Y2-S1	Moist, brownish grey sand	SP	98	2	--	14.7	99.3	0.7	NON-PLASTIC		
VC01Y2-S2	Moist, brownish grey sand	SP	100	3	--	15.9	99.4	0.6	NON-PLASTIC		
VC01Y3-S1	Wet, dark greyish brown sand	SP	97	3	--	17.9	99.6	0.4	NON-PLASTIC		
VC01Y3-S2	Moist, dark greyish brown sand	SP	99	3	--	18.9	99.8	0.2	NON-PLASTIC		
VC01Y4-S1	Wet, grey sand	SP	100	1	--	19.1	99.8	0.2	NON-PLASTIC		
VC01Y4-S2	Wet, grey sand	SP	99	2	--	15.1	99.7	0.3	NON-PLASTIC		
VC01Y5-S1	Moist, olive sand	SP	100	2	--	16.4	99.9	0.1	NON-PLASTIC		
VC01Y5-S2	Moist, olive sand	SP	100	2	--	17.3	99.9	0.1	NON-PLASTIC		
VC01Y5-S3	Moist, olive sand with silt	SP-SM	100	7	--	15.8	99.8	0.2	NON-PLASTIC		
VC01Y6-S1	Moist, dark grey sand with silt	SP	100	5	--	17.8	99.6	0.4	NON-PLASTIC		
VC01Y6-S2	Moist, dark grey sand	SP	100	3	--	12.1	99.7	0.3	NON-PLASTIC		
VC01Y6-S3	Wet, grey sand	SP	100	2	--	15.7	99.7	0.3	NON-PLASTIC		
VC01Y7-S1	Moist, grey sand	SP	100	2	--	15.0	99.7	0.3	NON-PLASTIC		

Sample No.	Laboratory Visual Descriptions	ASTM Classification Group Symbol	Gradation Analysis (ASTM D422)			ASTM D2974	ASTM D2974		Atterberg Limits (ASTM D4318)		
			Percent Passing No.4 (%)	Percent Passing No.200 (%)	Hydrometer	Moisture Content (%)	Ash Content (%)	Organic Content (%)	Liquid Limit (LL)	Plastic limit (PL)	Plasticity Index (PI)
VC01Y7-S2	Moist, olive grey sand	SP	100	1	--	13.4	99.9	0.1	NON-PLASTIC		
VC01Y7-S3	Moist, olive grey silty sand	SM	100	15	X	12.3	98.3	1.7	NON-PLASTIC		
VC01Y8-S1	Wet, grey sand	SP	93	3	--	14.6	99.0	1.0	NON-PLASTIC		
VC01Y8-S2	Wet, light brownish grey silty sand	SM	97	25	X	17.3	98.1	1.9	NON-PLASTIC		
VC03-10 S1	Moist, light olive gray sand	SP	94	2	--	15.1	99.8	0.2	Non-plastic		
VC03-11 S1	Moist, gray sand with silt	SP-SM	100	7	--	22.9	99.7	0.3	Non-plastic		
VC03-12 S1	Moist, gray sand with silt	SP	100	2	--	9.5	99.9	0.1	Non-plastic		
VC03-13 S1	Moist, dark olive gray silty sand	SM	100	16	X	22.5	99.2	0.8	Non-plastic		
VC03-13 S2	Moist, black sand with silt	SP-SM	100	11	X	44.6	93.5	6.5	43.5	34.5	9.0
VC03-14 S1	Moist, gray sand	SP	99	1	--	15.6	99.8	0.2	Non-plastic		
VC03-15 S1	Moist, pale yellow sand	SP	90	2	--	11.3	99.8	0.2	Non-plastic		
VC03-16 S1	Moist, gray sand	SP	99	1	--	13.8	99.8	0.2	Non-plastic		
VC03-16 S2	Moist, olive gray sand	SP	94	1	--	9.9	99.9	0.1	Non-plastic		
VC03-17 S1	Moist, olive gray sand	SP	100	2	--	9.2	100.0	0.0	Non-plastic		
VC03-18 S1	Moist, olive gray sand	SP	98	1	--	16.1	99.9	0.1	Non-plastic		
VC03-18 S2	Moist, olive gray sand	SP	97	4	--	20.5	99.3	0.7	Non-plastic		
VC03-19 S1	Moist, black sandy clay	CH	100	64	X	100.8	93.5	6.5	90.7	29.6	61.0
VC03-19 S2	Moist, black sandy clay	CH	99	50	X	60.4	97.1	2.9	50.6	20.1	30.5
VC03-20 S1	Moist, olive gray sand	SP	93	1	--	12.9	99.9	0.1	Non-plastic		
VC03-20 S2	Moist, black clayey sand	SC	98	48	X	69.1	93.9	6.1	74.1	27.9	46.2
VC03-22 S1	Moist, very dark gray sand with silt	SP-SM	100	10	X	25.3	98.9	1.1	Non-plastic		
VC03-22 S2	Moist, olive gray sand	SP	98	4	--	15.6	99.8	0.2	Non-plastic		

Sample No.	Laboratory Visual Descriptions	ASTM Classification Group Symbol	Gradation Analysis (ASTM D422)			ASTM D2974	ASTM D2974		Atterberg Limits (ASTM D4318)		
			Percent Passing No.4 (%)	Percent Passing No.200 (%)	Hydrometer	Moisture Content (%)	Ash Content (%)	Organic Content (%)	Liquid Limit (LL)	Plastic limit (PL)	Plasticity Index (PI)
VC03-23 S1	Moist, dark olive gray sand with clay	SP-SC	86	6	--	25.5	97.9	2.1	45.7	24.3	21.5
VC03-23 S2	Moist, olive gray sand	SP	100	3	--	15.3	99.9	0.1	Non-plastic		
VC03-24 S1	Moist, black sand with clay	SP-SC	86	12	X	29.6	98.5	1.5	63.5	21.3	42.2
VC03-24 S2	Moist, very dark brown sand	SP	91	4	--	16.0	98.5	1.5	32.7	22.7	9.9

--- = analysis not performed as sample contained <5% fines x = analysis performed

Classification Group Symbol Key

MH Elastic Silt with Sand
ML Sandy Silt
CH Sandy fat clay
CL Sandy lean clay
SM Silty Sand
SP Poorly Graded Sand
SC Clayey Sand
SW Well-graded sand with gravel

Table 5.1-4: Summary of Sediment Chemical Analytical Results (Metals, Total Organic Carbon, and Total Petroleum Hydrocarbons) for the Cape Wind Project

Parameter	Core Number		VC01-G4		VC01-G1		VC01-G3		VC01-MT1		VC01-L3		VC01-G13		VC01-G5	
	Sample Designation		VC01-G4-S1		VC01-G1-S2		VC01-G3-S1		VC01-MT1-S1		VC01-L3-S1		VC01-G13-S1		VC01-G5-S1	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 10		Composite 10 - 16.5		Composite 0 - 10		Composite 0 - 10		Composite 0 - 5		Composite 0 - 10		Composite 0 - 10	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
Total Metals (mg/kg)	**ERL**	**ERM**														
Arsenic	8.2	70	**0.84**		**1.9**		**1.4**		**0.76**		**0.65**		**0.79**		**0.71**	
Cadmium	1.2	9.6	**0.051**	U	**0.053**		**0.043**	U	**0.039**	U	**0.040**	U	**0.040**	U	**0.040**	U
Chromium	81	370	**1.8**		**3.6**		**1.4**		**0.68**		**0.65**		**1.4**		**1.4**	
Copper	34	270	**0.76**		**1.1**		**0.43**	U	**0.39**	U	**0.40**	U	**0.82**		**0.72**	
Lead	46.7	218	**1.2**		**1.8**		**1.2**		**0.66**		**0.56**		**0.80**		**1.2**	
Mercury	0.15	0.71	**0.013**	U	**0.013**	U	**0.011**	U	**0.011**	U	**0.010**	U	**0.011**	U	**0.011**	U
Nickel	20.9	51.6	**0.96**		**2.1**		**1**		**0.30**		**0.25**		**1.5**		**0.83**	
Vanadium			**3.1**		**5.9**		**5.1**		**1.7**		**1.4**		**1.7**		**2.7**	
Zinc	150	410	**5.5**		**6.1**		**3.2**		**2.9**		**1.4**		**3.1**		**2.8**	
TOC Run 1 (mg/kg)	--	--	7618		1173		236		120		ND		ND		143	
TOC Run 2 (mg/kg)	--	--	7780		1263		230		117		ND		ND		144	
Total Petroleum Hydrocarbons (mg/Kg)																
C9-C18 Hydrocarbons	--	--														
C19-C36 Hydrocarbons	--	--														
TOTAL			**130**		**11**		**7.1**		5.6	U	5.6	U	5.6	U	5.8	U

Parameter	Core Number		VC01-G11		VC01-P1		VC01-Y1		VC01-Y1		VC01-Y4		VC01-C5		VC01-C1	
	Sample Designation		VC01-G11-S1		VC01-P1-S1		VC01-Y1-S1		VC01-Y1-S2		VC01-Y4-S1		VC01-C5-S1		VC01-C1-S1	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 10		Composite 0 - 5		Composite 0 - 5		Composite 5 - 9.5		Composite 0 - 5		Composite 0 - 5		Composite 0 - 5	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
Total Metals (mg/kg)	**ERL**	**ERM**														
Arsenic	8.2	70	**5.7**		**0.40**		**0.62**		**3.1**		**0.24**	U	**0.74**		**1.2**	
Cadmium	1.2	9.6	**0.32**		**0.051**	U	**0.053**	U	**0.053**		**0.048**	U	**0.053**	U	**0.055**	
Chromium	81	370	**11**		**0.50**		**1.2**		**13**		**0.96**		**0.91**		**2.3**	
Copper	34	270	**5.0**		**0.51**	U	**0.72**		**6.9**		**0.48**	U	**0.53**	U	**1.2**	
Lead	46.7	218	**4.2**		**0.81**		**1.0**		**5.1**		**0.48**	U	**0.75**		**1.7**	
Mercury	0.15	0.71	**0.012**	U	**0.011**	U	**0.012**	U	**0.011**	U	**0.013**	U	**0.012**	U	**0.011**	U
Nickel	20.9	51.6	**7.8**		**0.43**		**0.70**		**10**		**0.41**		**0.37**		**1.6**	
Vanadium			**24**		**1.4**		**2.2**		**16**		**1.2**		**1.2**		**4.2**	
Zinc	150	410	**21**		**6.4**		**3.8**		**30**		**2.4**		**1.8**		**7.5**	
TOC Run 1 (mg/kg)	--	--	9569		150		228		667		214		256		1055	
TOC Run 2 (mg/kg)	--	--	9588		154		235		662		201		244		1041	
Total Petroleum Hydrocarbons (mg/Kg)																
C9-C18 Hydrocarbons	--	--														
C19-C36 Hydrocarbons	--	--														
TOTAL			**21**		5.6	U	**12**		6.0	U	5.8	U	5.9	U	5.6	U

Parameter	Core Number		VC01-Y2		VC01-P4		VC01-P4		VC01-P3		VC01-C7		VC01-Y8		VC01-PB1	
	Sample Designation		VC01-Y2-S1		VC01-P4-S1		VC01-P4-S2		VC01-P3-S1		VC01-C7-S1		VC01-Y8-S2		VC01-PB1-S1	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 5		Composite 0 - 5		Composite 5 - 9.5		Composite 0 - 5		Composite 0 - 5		Composite 0 - 5		Composite 0 - 5	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
Total Metals (mg/kg)	**ERL**	**ERM**														
Arsenic	8.2	70	**0.67**		**2.3**		**4.0**		**1.0**		**4.6**		**5.4**		**7.0**	
Cadmium	1.2	9.6	**0.048**	U	**0.048**		**0.053**	U	**0.050**	U	**0.17**		**0.031**	U	**0.76**	
Chromium	81	370	**1.7**		**5.9**		**32**		**2.9**		**6.4**		**11**		**26**	
Copper	34	270	**0.70**		**3.2**		**12**		**1.2**		**2.6**		**6.2**		**11**	
Lead	46.7	218	**1.1**		**2.8**		**12**		**1.7**		**2.5**		**5.4**		**9.5**	
Mercury	0.15	0.71	**0.011**	U	**0.013**	U	**0.016**		**0.013**	U	**0.014**	U	**0.012**	U	**0.025**	U
Nickel	20.9	51.6	**0.77**		**4.2**		**21**		**1.4**		**12**		**7.9**		**17**	
Vanadium			**2.5**		**7.7**		**37**		**3.8**		**13**		**14**		**43**	
Zinc	150	410	**4.7**		**11**		**53**		**5.1**		**57**		**22**		**44**	
TOC Run 1 (mg/kg)	--	--	178		1193		3235		240		10186		220		27434	
TOC Run 2 (mg/kg)	--	--	169		1159		3217		240		10374		227		27137	
Total Petroleum Hydrocarbons (mg/Kg)																
C9-C18 Hydrocarbons	--	--														
C19-C36 Hydrocarbons	--	--														
TOTAL			5.7	U	7.9	U	6.5	U	5.9	U	**24**		**6.1**		**25**	

Parameter	Core Number		VC01-PB1		VC01-D1		VC01-PB2		VC01-PB2		VC01-L1		VC01-L1	
	Sample Designation		VC01-PB1-S2		VC01-D1-S1		VC01-PB2-S1		VC01-PB2-S2		VC01-LI-S1		VC01-L1-S2	
	Sample Interval (ft below seabottom)[1]		Composite 5 - 7.7		Composite 0 - 5		Composite 0 - 5		Composite 5 - 7.8		Composite 0 - 5		Composite '5 - 10	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results	
Total Metals (mg/kg)	**ERL**	**ERM**												
Arsenic	8.2	70	**7.2**		**6.1**		**6.2**		**4.7**		**3.4**		**3.3**	
Cadmium	1.2	9.6	**0.79**		**0.68**		**0.56**		**0.54**		**0.16**		**0.092**	
Chromium	81	370	**25**		**24**		**22**		**14**		**5.5**		**4.6**	
Copper	34	270	**11**		**10**		**9.8**		**5.8**		**2.7**		**1.8**	
Lead	46.7	218	**7.8**		**8.6**		**9**		**4.2**		**2.3**		**2.1**	
Mercury	0.15	0.71	**0.021**	U	**0.021**	U	**0.022**	U	**0.016**	U	**0.013**	U	**0.013**	U
Nickel	20.9	51.6	**16**		**15**		**14**		**8.4**		**3.7**		**3.6**	
Vanadium			**36**		**37**		**36**		**22**		**11**		**7.7**	
Zinc	150	410	**41**		**38**		**40**		**21**		**8.8**		**8.2**	
TOC Run 1 (mg/kg)	--	--	22891		27053		21711		17258		6319		9754	
TOC Run 2 (mg/kg)	--	--	24043		27149		21266		18783		6183		9446	
Total Petroleum Hydrocarbons (mg/Kg)														
C9-C18 Hydrocarbons	--	--												
C19-C36 Hydrocarbons	--	--												
TOTAL			**49**		**12**		**19**		**14**		6.8	U	**54**	

Parameter	Core Number		VC03-13				VC03-19				VC03-20				VC03-23			
	Sample Designation		VC03-13 S1		VC03-13 S2		VC03-19 S1		VC03-19 S2		VC03-20 S1		VC03-20 S2		VC03-23 S1		VC03-23 S2	
	Sample Interval (ft below seabottom)[1]		Composite 0-5'		Composite 5-9.8		Composite 0-5		Composite 5-9.8		Composite 0-5.2		Composite 5.2-8		Composite 0-5		Composite 5-7.8	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results		Results	
Total Metals (mg/kg)	**ERL**	**ERM**																
Arsenic	8.2	70	**3.5**		**3.8**		**5.7**		**6.3**		**0.67**		**2.2**		**0.92**		**0.36**	
Cadmium	1.2	9.6	**0.029**		**0.12**		**0.85**		**0.41**		0.024	U	**0.260**		0.024	U	0.025	U
Chromium	81	370	**4.3**		**4.4**		**21**		**14**		**1.7**		**9.0**		**2.6**		**1.4**	
Copper	34	270	**1.4**		**2.3**		**10**		**6.4**		**0.70**		**4.1**		**1.2**		**0.8**	
Lead	46.7	218	**2.6**		**1.8**		**7.1**		**4.5**		**1.2**		**3.50**		**2.6**		**0.98**	
Mercury	0.15	0.71	0.009	U	**0.016**		**0.015**		0.0095	U	0.010	U	0.0094	U	0.0091	U	0.0098	U
Nickel	20.9	51.6	**2.4**		**3.8**		**14**		**9.3**		**1.4**		**5.8**		**1.3**		**0.84**	
Vanadium			**9.8**		**9.5**		**33**		**26**		**3.2**		**14**		**4.1**		**2.0**	
Zinc	150	410	**7.5**		**8.8**		**35**		**23**		**5.3**		**14**		**3.6**		**2.7**	
TOC Run 1 (mg/kg)	--	--	**0.27**		**1.5**		**3.2**		**1.2**		**0.02**		**1.0**		**1.0**		0.01	U
TOC Run 2 (mg/kg)	--	--	**0.22**		**1.5**		**3.1**		**1.5**		**0.01**		**1.3**		**1.2**		0.01	U
Total Petroleum Hydrocarbons (mg/Kg)																		
C9-C18 Hydrocarbons	--	--																
C19-C36 Hydrocarbons	--	--																
TOTAL			48	U	**250**		85	U	64	U	45	U	54	U	46	U	45	U

Notes:
Analysis Conducted by Woods Hole Group Environmental Laboratories; Raynham, Massachusetts
1. Samples composited over core depth intervals.
2. Guidelines from Long et al (1995) used for evaluation of risk from contaminants in marine and estuarine sediments.
Long, E.R., D.D. MacDonald, S. L. Smith, F.D. Calder. 1995. Incidence of Adverse Biological Effects Within Ranges of Chemical Concentrations in Marine and Estuarine Sediments. Environmental Management. Vol. 19, No. 1, p. 81-97
ER-L = Effects range- low; ER-M = Effects range- median; ND= Not Applicable; U= The analyte was analyzed for but not detected at the sample specific level reported; mg/kg = milligrams per killogram

Table 5.1-5: Summary of Sediment Chemical Analytical Results (Polychlorinated Biphenyl Congeners and Pesticides) for the Cape Wind Project

Parameter	Core Number		VC01-G4		VC01-G1		VC01-G3		VC01-MT1		VC01-L3		VC01-G13		VC01-G5	
	Sample Designation		VC01-G4-S1		VC01-G1-S2		VC01-G3-S1		VC01-MT1-S1		VC01-L3-S1		VC01-G13-S1		VC01-G5-S1	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 10		Composite 10 - 16.5		Composite 0 - 10		Composite 0 - 10		Composite 0 - 5		Composite 0 - 10		Composite 0 - 10	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
PCB Congeners (ug/kg)	**ERL**	**ERM**														
BZ8*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ18*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ28*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ44*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ49*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ52*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	**0.55**	P	0.12	U
BZ66*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ87*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ101*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ105*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ118*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ128*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ138*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ153*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ170*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ180*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ183*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ184*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ187*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ195*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ206*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
BZ209*	--	--	0.12	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.12	U
Total PCBs	22.7	180														
Pesticides (ug/kg)																
Aldrin	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Alpha-BHC	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Alpha-chlordane	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U

Parameter	Core Number		VC01-G4		VC01-G1		VC01-G3		VC01-MT1		VC01-L3		VC01-G13		VC01-G5	
	Sample Designation		VC01-G4-S1		VC01-G1-S2		VC01-G3-S1		VC01-MT1-S1		VC01-L3-S1		VC01-G13-S1		VC01-G5-S1	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 10		Composite 10 - 16.5		Composite 0 - 10		Composite 0 - 10		Composite 0 - 5		Composite 0 - 10		Composite 0 - 10	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
Beta-BHC	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Delta-BHC	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Gamma-BHC	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Gamma-chlordane	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
4,4'-DDD	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
4,4'-DDE	2.2	27	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
4,4'-DDT	1.58	46.1	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Dieldrin	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Endosulfan I	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Endosulfan II	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Endosulfan sulfate	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Endrin	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Endrin ketone	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Endrin aldehyde	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Heptachlor	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Heptachlor epoxide (B)	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Methoxychlor	--	--	0.62	U	0.60	U	0.57	U	0.55	U	0.56	U	0.56	U	0.58	U
Toxaphene	--	--	12	U	12	U	11	U	11	U	11	U	11	U	12	U

Parameter	Core Number		VC01-G11		VC01-P1		VC01-Y1		VC01-Y1		VC01-Y4		VC01-C5	
	Sample Designation		VC01-G11-S1		VC01-P1-S1		VC01-Y1-S1		VC01-Y1-S2		VC01-Y4-S1		VC01-C5-S1	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 10		Composite 0 - 5		Composite 0 - 5		Composite 5 - 9.5		Composite 0 - 5		Composite 0 - 5	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results	
PCB Congeners (ug/kg)	**ERL**	**ERM**												
BZ8*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ18*	--	--	0.13	U	1.11	U	1.11	U	1.12	U	1.11	U	1.12	U
BZ28*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ44*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ49*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ52*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ66*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ87*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ101*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ105*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ118*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ128*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ138*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ153*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ170*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ180*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ183*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ184*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ187*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ195*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ206*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
BZ209*	--	--	0.13	U	0.11	U	0.11	U	0.12	U	0.11	U	0.12	U
Total PCBs	22.7	180												
Pesticides (ug/kg)														
Aldrin	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Alpha-BHC	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Alpha-chlordane	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Beta-BHC	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U

Parameter	Core Number		VC01-G11		VC01-P1		VC01-Y1		VC01-Y1		VC01-Y4		VC01-C5	
	Sample Designation		VC01-G11-S1		VC01-P1-S1		VC01-Y1-S1		VC01-Y1-S2		VC01-Y4-S1		VC01-C5-S1	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 10		Composite 0 - 5		Composite 0 - 5		Composite 5 - 9.5		Composite 0 - 5		Composite 0 - 5	
Delta-BHC	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Gamma-BHC	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Gamma-chlordane	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
4,4'-DDD	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
4,4'-DDE	2.2	27	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
4,4'-DDT	1.58	46.1	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Dieldrin	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Endosulfan I	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Endosulfan II	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Endosulfan sulfate	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Endrin	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Endrin ketone	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Endrin aldehyde	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Heptachlor	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Heptachlor epoxide (B)	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Methoxychlor	--	--	0.66	U	0.54	U	0.56	U	0.59	U	0.56	U	0.58	U
Toxaphene	--	--	13	U	11	U	11	U	12	U	11	U	12	U

Parameter	Core Number		VC01-C1		VC01-Y2		VC01-P4		VC01-P4		VC01-P3		VC01-C7		VC01-Y8	
	Sample Designation		VC01-C1-S1		VC01-Y2-S1		VC01-P4-S1		VC01-P4-S2		VC01-P3-S1		VC01-C7-S1		VC01-Y8-S2	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 5		Composite 0 - 5		Composite 0 - 5		Composite 5 - 9.5		Composite 0 - 5		Composite 0 - 5		Composite 0 - 5	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
PCB Congeners (ug/kg)	**ERL**	**ERM**														
BZ8*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ18*	--	--	1.11	U	1.12	U	1.11	U	1.13	U	1.12	U	1.14	U	1.11	U
BZ28*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ44*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ49*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ52*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ66*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ87*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ101*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ105*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ118*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ128*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ138*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ153*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ170*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ180*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ183*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ184*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ187*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ195*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ206*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
BZ209*	--	--	0.11	U	0.12	U	0.11	U	0.13	U	0.12	U	0.14	U	0.11	U
Total PCBs	22.7	180														
Pesticides (ug/kg)																
Aldrin	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Alpha-BHC	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U

Parameter	Core Number		VC01-C1		VC01-Y2		VC01-P4		VC01-P4		VC01-P3		VC01-C7		VC01-Y8	
	Sample Designation		VC01-C1-S1		VC01-Y2-S1		VC01-P4-S1		VC01-P4-S2		VC01-P3-S1		VC01-C7-S1		VC01-Y8-S2	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 5		Composite 0 - 5		Composite 0 - 5		Composite 5 - 9.5		Composite 0 - 5		Composite 0 - 5		Composite 0 - 5	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
Alpha-chlordane	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Beta-BHC	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Delta-BHC	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Gamma-BHC	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Gamma-chlordane	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
4,4'-DDD	--	--	0.54	U	0.58	U	0.57	U	**0.80**		0.58	U	0.72	U	0.57	U
4,4'-DDE	2.2	27	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
4,4'-DDT	1.58	46.1	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Dieldrin	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Endosulfan I	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Endosulfan II	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Endosulfan sulfate	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Endrin	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Endrin ketone	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Endrin aldehyde	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Heptachlor	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Heptachlor epoxide (B)	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Methoxychlor	--	--	0.54	U	0.58	U	0.57	U	0.63	U	0.58	U	0.72	U	0.57	U
Toxaphene	--	--	11	U	12	U	11	U	13	U	12	U	14	U	11	U

Parameter	Core Number		VC01-PB1		VC01-PB1		VC01-D1		VC01-PB2		VC01-PB2		VC01-L1		VC01-L1	
	Sample Designation		VC01-PB1-S1		VC01-PB1-S2		VC01-D1-S1		VC01-PB2-S1		VC01-PB2-S2		VC01-LI-S1		VC01-L1-S2	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 5		Composite 5 - 7.7		Composite 0 - 5		Composite 0 - 5		Composite 5 - 7.8		Composite 0 - 5		Composite '5 - 10	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
PCB Congeners (ug/kg)	**ERL**	**ERM**														
BZ8*	--	--	0.25	U	1.20	U	1.22	U	1.21	U	1.17	U	1.13	U	1.13	U
BZ18*	--	--	1.25	U	**1.7**		0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ28*	--	--	0.25	U	**2.7**		0.22	U	0.21	U	0.17	U	0.13	U	**0.91**	
BZ44*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ49*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ52*	--	--	0.25	U	**3.8**	IB	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ66*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ87*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ101*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ105*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ118*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ128*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ138*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ153*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ170*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ180*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ183*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ184*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ187*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ195*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ206*	--	--	0.25	U	0.20	U	0.22	U	0.21	U	0.17	U	0.13	U	0.13	U
BZ209*	--	--	0.25	U	1.20	U	1.22	U	1.21	U	1.17	U	1.13	U	1.13	U
Total PCBs	22.7	180														
Pesticides (ug/kg)																
Aldrin	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Alpha-BHC	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Alpha-chlordane	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U

Parameter	Core Number		VC01-PB1		VC01-PB1		VC01-D1		VC01-PB2		VC01-PB2		VC01-L1		VC01-L1	
	Sample Designation		VC01-PB1-S1		VC01-PB1-S2		VC01-D1-S1		VC01-PB2-S1		VC01-PB2-S2		VC01-LI-S1		VC01-L1-S2	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 5		Composite 5 - 7.7		Composite 0 - 5		Composite 0 - 5		Composite 5 - 7.8		Composite 0 - 5		Composite '5 - 10	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
Beta-BHC	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Delta-BHC	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Gamma-BHC	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	**0.88**	
Gamma-chlordane	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
4,4'-DDD	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
4,4'-DDE	2.2	27	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
4,4'-DDT	1.58	46.1	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Dieldrin	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Endosulfan I	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Endosulfan II	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Endosulfan sulfate	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Endrin	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Endrin ketone	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Endrin aldehyde	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Heptachlor	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Heptachlor epoxide (B)	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Methoxychlor	--	--	1.3	U	1.0	U	1.1	U	1.1	U	0.84	U	0.66	U	0.66	U
Toxaphene	--	--	25	U	20	U	22	U	21	U	17	U	13	U	13	U

Parameter	Core Number		VC03-13						VC03-19		VC03-20				VC03-23			
	Sample Designation		VC03-13 S1		VC03-13 S2		VC03-19 S1		VC03-19 S2		VC03-20 S1		VC03-20 S2		VC03-23 S1		VC03-23 S2	
	Sample Interval (ft below seabottom)[1]		Composite 0-5'		Composite 5-9.8		Composite 0-5		Composite 5-9.8		Composite 0-5.2		Composite 5.2-8		Composite 0-5		Composite 5-7.8	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results		Results	
PCB Congeners (ug/kg)	**ERL**	**ERM**																
BZ8*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ18*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ28*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ44*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ49*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ52*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	**1.7**	P	0.47	U	0.45	U
BZ66*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ87*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ101*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ105*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ118*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ128*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ138*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ153*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ170*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ180*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ183*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ184*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ187*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ195*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ206*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
BZ209*	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Total PCBs	22.7	180																
Pesticides (ug/kg)																		
Aldrin	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Alpha-BHC	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Alpha-chlordane	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U

Parameter	Core Number		VC03-13						VC03-19		VC03-20				VC03-23			
	Sample Designation		VC03-13 S1		VC03-13 S2		VC03-19 S1		VC03-19 S2		VC03-20 S1		VC03-20 S2		VC03-23 S1		VC03-23 S2	
	Sample Interval (ft below seabottom)[1]		Composite 0-5'		Composite 5-9.8		Composite 0-5		Composite 5-9.8		Composite 0-5.2		Composite 5.2-8		Composite 0-5		Composite 5-7.8	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results		Results	
Beta-BHC	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Delta-BHC	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Gamma-BHC	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Gamma-chlordane	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
4,4'-DDD	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
4,4'-DDE	2.2	27	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
4,4'-DDT	1.58	46.1	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Dieldrin	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Endosulfan I	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Endosulfan II	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Endosulfan sulfate	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Endrin	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Endrin ketone	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Endrin aldehyde	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Heptachlor	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Heptachlor epoxide (B)	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Methoxychlor	--	--	0.48	U	0.55	U	0.85	U	0.62	U	0.45	U	0.55	U	0.47	U	0.45	U
Toxaphene	--	--	48	U	55	U	85	U	62	U	45	U	55	U	47	U	45	U

Notes:
Analysis Conducted by Woods Hole Group Environmental Laboratories; Raynham, Massachusetts
1. Samples composited over core depth intervals.
2. Guidelines from Long et al (1995) used for evaluation of risk from contaminants in marine and estuarine sediments.
Long, E.R., D.D. MacDonald, S. L. Smith, F.D. Calder. 1995. Incidence of Adverse Biological Effects Within Ranges of Chemical Concentrations in Marine and Estuarine Sediments. Environmental Management. Vol. 19, No. 1, p. 81-97
ER-L = Effects range- low; ER-M = Effects range- median; ND= Not Applicable; U= The analyte was analyzed for but not detected at the sample specific level reported; mg/kg = milligrams per killogram

Table 5.1-6: Summary of Sediment Chemical Analytical Results (Polynuclear Aromatic Hydrocarbon Results) for the Cape Wind Project

Parameter	Core Number		VC01-G4		VC01-G1		VC01-G3		VC01-MT1		VC01-L3		VC01-G13		VC01-G5	
	Sample Designation		VC01-G4-S1		VC01-G1-S2		VC01-G3-S1		VC01-MT1-S1		VC01-L3-S1		VC01-G13-S1		VC01-G5-S1	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 10		Composite 10 - 16.5		Composite 0 - 10		Composite 0 - 10		Composite 0 - 5		Composite 0 - 10		Composite 0 - 10	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
Polynuclear Aromatic Hydrocarbons (ug/kg)	**ERL**	**ERM**														
Naphthalene	160	2100	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
2-Methylnaphthalene	70	670	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
1-Methylnaphthalene	--	--	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Biphenyl	--	--	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
2,6-Dimethylnaphthalene	--	--	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Acenaphthylene	44	640	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Acenaphthene	16	500	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Fluorene	19	540	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Phenanthrene	240	1500	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Anthracene	85.3	1100	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
1-Methylphenanthrene	--	--	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Fluoranthene	600	5100	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Pyrene	665	2600	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Benzo[a]anthracene	261	1600	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Chrysene	384	2800	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Benzo[b]fluoranthene	--	--	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Benzo[k]fluoranthene	--	--	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Benzo[e]pyrene	--	--	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Benzo[a]pyrene	430	1600	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Perylene	--	--	**21**		6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Indeno[1,2,3-cd]pyrene	--	--	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Dibenz[a,h]anthracene	63.4	260	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U
Benzo[g,h,i]perylene	--	--	6.2	U	6.0	U	5.7	U	5.5	U	5.6	U	5.6	U	5.8	U

Parameter	Core Number		VC01-G11		VC01-P1		VC01-Y1		VC01-Y1		VC01-Y4		VC01-C5		VC01-C1	
	Sample Designation		VC01-G11-S1		VC01-P1-S1		VC01-Y1-S1		VC01-Y1-S2		VC01-Y4-S1		VC01-C5-S1		VC01-C1-S1	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 10		Composite 0 - 5		Composite 0 - 5		Composite 5 - 9.5		Composite 0 - 5		Composite 0 - 5		Composite 0 - 5	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
Polynuclear Aromatic Hydrocarbons (ug/kg)	**ERL**	**ERM**														
Naphthalene	160	2100	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
2-Methylnaphthalene	70	670	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
1-Methylnaphthalene	--	--	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Biphenyl	--	--	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
2,6-Dimethylnaphthalene	--	--	**10**		5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Acenaphthylene	44	640	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Acenaphthene	16	500	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Fluorene	19	540	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Phenanthrene	240	1500	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Anthracene	85.3	1100	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
1-Methylphenanthrene	--	--	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Fluoranthene	600	5100	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Pyrene	665	2600	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Benzo[a]anthracene	261	1600	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Chrysene	384	2800	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Benzo[b]fluoranthene	--	--	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Benzo[k]fluoranthene	--	--	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Benzo[e]pyrene	--	--	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Benzo[a]pyrene	430	1600	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Perylene	--	--	**8.4**		5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Indeno[1,2,3-cd]pyrene	--	--	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Dibenz[a,h]anthracene	63.4	260	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U
Benzo[g,h,i]perylene	--	--	6.6	U	5.4	U	5.6	U	5.9	U	5.6	U	5.8	U	5.4	U

Parameter	Core Number		VC01-Y2		VC01-P4		VC01-P4		VC01-P3		VC01-C7		VC01-Y8		VC01-PB1	
	Sample Designation		VC01-Y2-S1		VC01-P4-S1		VC01-P4-S2		VC01-P3-S1		VC01-C7-S1		VC01-Y8-S2		VC01-PB1-S1	
	Sample Interval (ft below seabottom)[1]		Composite 0 - 5		Composite 0 - 5		Composite 5 - 9.5		Composite 0 - 5		Composite 0 - 5		Composite 0 - 5		Composite 0 - 5	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results	
Polynuclear Aromatic Hydrocarbons (ug/kg)	**ERL**	**ERM**														
Naphthalene	160	2100	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
2-Methylnaphthalene	70	670	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
1-Methylnaphthalene	--	--	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Biphenyl	--	--	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
2,6-Dimethylnaphthalene	--	--	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Acenaphthylene	44	640	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Acenaphthene	16	500	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Fluorene	19	540	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Phenanthrene	240	1500	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Anthracene	85.3	1100	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
1-Methylphenanthrene	--	--	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Fluoranthene	600	5100	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Pyrene	665	2600	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Benzo[a]anthracene	261	1600	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Chrysene	384	2800	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Benzo[b]fluoranthene	--	--	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Benzo[k]fluoranthene	--	--	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Benzo[e]pyrene	--	--	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Benzo[a]pyrene	430	1600	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Perylene	--	--	5.8	U	5.8	U	**11**		5.8	U	**17**		5.7	U	**83**	
Indeno[1,2,3-cd]pyrene	--	--	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Dibenz[a,h]anthracene	63.4	260	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U
Benzo[g,h,i]perylene	--	--	5.8	U	5.8	U	6.3	U	5.8	U	7.2	U	5.7	U	13	U

Parameter	Core Number		VC01-PB1		VC01-D1		VC01-PB2		VC01-PB2		VC01-L1		VC01-L1	
	Sample Designation		VC01-PB1-S2		VC01-D1-S1		VC01-PB2-S1		VC01-PB2-S2		VC01-LI-S1		VC01-L1-S2	
	Sample Interval (ft below seabottom)[1]		Composite 5 - 7.7		Composite 0 - 5		Composite 0 - 5		Composite 5 - 7.8		Composite 0 - 5		Composite '5 - 10	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results	
Polynuclear Aromatic Hydrocarbons (ug/kg)	**ERL**	**ERM**												
Naphthalene	160	2100	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
2-Methylnaphthalene	70	670	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
1-Methylnaphthalene	--	--	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Biphenyl	--	--	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
2,6-Dimethylnaphthalene	--	--	10	U	11	U	11	U	**13**		6.6	U	6.6	U
Acenaphthylene	44	640	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Acenaphthene	16	500	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Fluorene	19	540	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Phenanthrene	240	1500	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Anthracene	85.3	1100	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
1-Methylphenanthrene	--	--	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Fluoranthene	600	5100	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Pyrene	665	2600	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Benzo[a]anthracene	261	1600	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Chrysene	384	2800	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Benzo[b]fluoranthene	--	--	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Benzo[k]fluoranthene	--	--	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Benzo[e]pyrene	--	--	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Benzo[a]pyrene	430	1600	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Perylene	--	--	**88**		**100**		**15**		8.4	U	6.6	U	**6.6**	
Indeno[1,2,3-cd]pyrene	--	--	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Dibenz[a,h]anthracene	63.4	260	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U
Benzo[g,h,i]perylene	--	--	10	U	11	U	11	U	8.4	U	6.6	U	6.6	U

Parameter	Core Number		VC03-13				VC03-19				VC03-20				VC03-23			
	Sample Designation		VC03-13 S1		VC03-13 S2		VC03-19 S1		VC03-19 S2		VC03-20 S1		VC03-20 S2		VC03-23 S1		VC03-23 S2	
	Sample Interval (ft below seabottom)[1]		Composite 0-5'		Composite 5-9.8		Composite 0-5		Composite 5-9.8		Composite 0-5.2		Composite 5.2-8		Composite 0-5		Composite 5-7.8	
	NOAA Marine Sediment Guidelines[2]		Results		Results		Results		Results		Results		Results		Results		Results	
Polynuclear Aromatic Hydrocarbons (ug/kg)	**ERL**	**ERM**																
Naphthalene	160	2100	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
2-Methylnaphthalene	70	670	12	U	**15**		21	U	16	U	11	U	14	U	12	U	11	U
1-Methylnaphthalene	--	--	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Biphenyl	--	--	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
2,6-Dimethylnaphthalene	--	--	12	U	**16**		21	U	16	U	11	U	14	U	12	U	11	U
Acenaphthylene	44	640	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Acenaphthene	16	500	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Fluorene	19	540	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Phenanthrene	240	1500	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Anthracene	85.3	1100	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
1-Methylphenanthrene	--	--	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Fluoranthene	600	5100	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Pyrene	665	2600	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Benzo[a]anthracene	261	1600	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Chrysene	384	2800	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Benzo[b]fluoranthene	--	--	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Benzo[k]fluoranthene	--	--	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Benzo[e]pyrene	--	--	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Benzo[a]pyrene	430	1600	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Perylene	--	--	12	U	**44**		21	U	16	U	11	U	**830**		12	U	11	U
Indeno[1,2,3-cd]pyrene	--	--	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Dibenz[a,h]anthracene	63.4	260	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U
Benzo[g,h,i]perylene	--	--	12	U	14	U	21	U	16	U	11	U	14	U	12	U	11	U

Notes: Analysis Conducted by Woods Hole Group Environmental Laboratories; Raynham, Massachusetts

1. Samples composited over core depth intervals. 2. Guidelines from Long et al (1995) used for evaluation of risk from contaminants in marine and estuarine sediments. Long, E.R., D.D. MacDonald, S. L. Smith, F.D. Calder. 1995. Incidence of Adverse Biological Effects Within Ranges of Chemical Concentrations in Marine and Estuarine Sediments. Environmental Management. Vol. 19, No. 1, p. 81-97

ER-L = Effects range- low; ER-M = Effects range- median; ND= Not Applicable; U= The analyte was analyzed for but not detected at the sample specific level reported; mg/kg = milligrams per killogram

Table 5.3-1: Summary statistics for invertebrate data collected from within and outside the three mile limit, August, 2001.

Outside Three Mile Limit		
Dominant taxa -Scientific Name	**Common Name**	**% of total community**
Ampeliscidae	Four-eyed amphipods	37.8
Ischyroceridae	Fouling amphipods	30.3
Crepidula fornicata	Common Atlantic slippersnail	10.2
Crepidula convexa	Convex slippersnail	3.5
Glycera dibranchiata	Blood worm	2.1
Nematoda	Roundworm	2.1
	% of total community represented	**86.0**
	Total Taxa Present	65
	Average Number of Taxa per sample	9.2
	Average Number of Individuals per m^2	5,611
Within Three Mile Limit		
Dominant taxa - Scientific Name	**Common Name**	**% of total community**
Crepidula convexa	Convex slippersnail	27.4
Crepidula fornicata	Common Atlantic slippersnail	12.1
Phoxocephalidae	Hood-headed amphipods	8.9
Nematoda	Roundworm	8.8
Lumbrineris sp.	Opal worm	6.8
Oligochaeta	Aquatic worm	4.4
	% of total community represented	**68.5**
	Total Taxa Present	50
	Average Number of Taxa per sample	11.6
	Average Number of Individuals per m^2	2,017

Table 5.3-2: Total landings of shellfish species from Nantucket Sound, from 1990 through 2000 (Source: MDMF data for Area 10, Nantucket Sound)

Shellfish Species harvested	Total lbs Landed (1990 - 2000)
Surf Clam	12,816,980
Mussel	8,548,273
Conch	3,229,377
Ocean Quahogs	66,560
Soft Shell Clam	42,285
Bay Scallop (w/ shells)	28,068
Bay Scallop (no shells)	17,813
Mixed Quahogs	3,985
Sea Scallops (no shells)	413
Littlenecks quahog	200

Table 5.3-3 Summary of Maximum Anticipated Temporary and Permanent Impacts to Benthic Habitat.

Temporary Impacts	Area of Impact (square feet)	Area of Impact (acres)	Area of Impact (square meters)	Percent of Project Area*	Percent of Nantucket Sound**
Outside 3-mile limit					
Inner-array cables					
Inner array cables	2,471,040	56.73	229,567	0.375	0.016
Pontoon impacts	2,471,040	56.73	229,567	0.375	0.016
Anchoring to install cables	563,940	12.95	52,392	0.083	0.0036
Anchor line sweep for installation	24,326,640	558.46	2,260,019	3.625	0.156
Sub-total	***29,832,660***	***684.87***	***2,771,545***	***4.458***	***0.192***
Submarine cable system					
115kV submarine cable system	354,816	8.15	32,963	0.054	0.0023
Pontoon impacts	354,816	8.15	32,963	0.054	0.0023
Anchoring to install cable system	80,976	1.86	7,523	0.0125	0.00054
Anchor line sweep for installation	3,493,056	80.19	324,516	0.5208	0.02232
Sub-total	***4,283,664***	***98.35***	***397,965***	***0.641***	***0.0275***
Anchoring to construct WTGs and ESP					
Anchoring for WTGs	264,680	6.08	24,590	0.0396	0.0016
Anchor line sweep for WTGs	19,140,160	439.40	1,778,179	2.863	0.1227
Anchoring for ESP	12,216	0.28	1,135	0.0018	0.00008
Anchor line sweep for ESP	883,392	20.28	82,070	0.133	0.0057
Jack-up barge for WTGs	536,640	12.32	49,855	0.080	0.0034
Jack-up barge for ESP	24,768	0.57	2,301	0.0038	0.00016
Sub-total	***20,861,856***	***478.93***	***1,938,130***	***3.121***	***0.1336***
Total Temporary Impacts Outside the 3-mile Limit	**54,978,180**	**1,262.13**	**5,107,640**	**8.217**	**0.352**
Inside the 3-mile limit					
Submarine cable system					
115kV submarine cable system	418,176	9.60	38,850	0.0625	0.00268
Pontoon impacts	418,176	9.60	38,850	0.0625	0.00268
Anchoring to install cable	95,436	2.19	8,866	0.014	0.0006
Anchor line sweep for installation	4,116,816	94.51	382,465	0.617	0.0264
Pre-excavation pit for HDD	2,925	0.067	272	0.0004	0.00002
Total Temporary Impacts Inside the 3-mile Limit	**5,051,529**	**115.97**	**469,302**	**0.754**	**0.032**
TOTAL TEMPORARY IMPACTS	**60,029,709**	**1,378.10**	**5,576,942**	**8.971**	**0.384**
Permanent Impacts					
WTG and ESP pilings	29,637	0.68	2,753	0.0046	0.0002
WTG and ESP scour control mats	110,160	2.53	10,234	0.016	0.0007
TOTAL PERMANENT IMPACTS	**139,797**	**3.21**	**12,987**	**0.0208**	**0.0009**
TOTAL FOR ALL IMPACTS	**60,169,506**	**1,381.30**	**5,589,930**	**8.992**	**0.385**

*Project Area ≅ 24 square miles (62 km^2)

**Area of Nantucket Sound ≅ 560 square miles (1,450 km^2)

Table 5.4-1: Likelihood of Occurrence for Species Collected during MDMF Spring Research Trawl Surveys at the Proposed Wind Park site (HSS) in Nantucket Sound

Very Common	Variably Common	Less Common	Rare	Very Rare	Not Observed
Channeled Whelk	Atlantic Cod	Butterfish	Alewife	American Shad	Atlantic Menhaden
Lady Crab	Atlantic Rock Crab	Cunner	American Lobster	Atlantic Herring	Atlantic Moonfish
Little Skate	Black Sea Bass	Fourspot Flounder	Northern Sand Lance	Atlantic Mackerel	Banded Rudderfish
Longfin Squid		Horseshoe Crab	Rock Gunnel	Atlantic Surfclam	Bigeye
Northern Searobin		Knobbed Whelk	Sea Raven	Bay Anchovy	Blue Mussel
Spider Crab Uncl		Longhorn Sculpin	Smallmouth Flounder	Bay Scallop	Blue Runner
Summer Flounder		Moon Snail Shark Eye And Baby- Ear	Smooth Dogfish	Blueback Herring	Bluefish
Windowpane		Scup	Spiny Dogfish	Gulf Stream Flounder	Bluespotted Cornetfish
Winter Flounder		Tautog		Longfin Squid Egg Mops	Flying Gurnard
Winter Skate				Northern Moonsnail	Guaguanche
				Northern Pipefish	Inshore Lizardfish
				Pollock	Jonah Crab
				Red Hake	Mackerel Scad
				Silver Hake	Northern Horsemussel
				Spotted Hake	Northern Kingfish
				Striped Searobin	Northern Puffer
				White Hake	Northern Sennet
					Northern Shortfin Squid
					Ocean Pout
					Planehead Filefish
					Rainbow Smelt
					Rough Scad
					Roughtail Stingray
					Sand Tiger
					Scrawled Filefish
					Short Bigeye
					Snakeblenny
					Snakefish
					Snowy Grouper
					Striped Anchovy
					Striped Bass

Table 5.4-2: Likelihood of Occurrence for Species Collected during MDMF Fall Research Trawl Surveys at the Proposed Wind Park site (HSS) in Nantucket Sound

Very Common	Variably Common	Less Common	Rare	Very Rare	Not Observed
Black Sea Bass	Channeled Whelk	Atlantic Rock Crab	Bay Anchovy	Atlantic Surfclam	Alewife
Butterfish	Winter Skate	Bluefish	Bluespotted Cornetfish	Banded Rudderfish	American Lobster
Knobbed Whelk		Cunner	Horseshoe Crab	Bigeye	American Shad
Lady Crab		Little Skate	Inshore Lizardfish	Blueback Herring	Atlantic Cod
Longfin Squid		Northern Kingfish	Mackerel Scad	Flying Gurnard	Atlantic Herring
Northern Searobin		Northern Pipefish	Moon Snail Shark Eye And Baby- Ear	Fourspot Flounder	Atlantic Mackerel
Scup		Northern Puffer	Planehead Filefish	Gulf Stream Flounder	Atlantic Menhaden
Smooth Dogfish		Smallmouth Flounder	Striped Anchovy	Red Hake	Atlantic Moonfish
Spider Crab Uncl		Tautog	Striped Searobin	Rock Gunnel	Bay Scallop
Summer Flounder		Windowpane	Winter Flounder	Roughtail Stingray	Blue Mussel
				Sand Tiger	Blue Runner
				Scrawled Filefish	Guaguanche
				Sea Raven	Jonah Crab
				Short Bigeye	Longfin Squid Egg Mops
				Snakefish	Longhorn Sculpin
					Northern Horsemussel
					Northern Moonsnail
					Northern Sand Lance
					Northern Sennet
					Northern Shortfin Squid
					Ocean Pout
					Pollock
					Rainbow Smelt
					Rough Scad
					Silver Hake
					Snakeblenny
					Snowy Grouper
					Spiny Dogfish
					Spotted Hake
					Striped Bass
					White Hake

Table 5.4-3: Number of Surveys Conducted in Dukes, Barnstable and Nantucket Counties (Source: NMFS MRFSS data from March – December 1990 through 2001)

Year	Number of surveys
1990	2916
1991	2479
1992	2503
1993	3105
1994	3063
1995	3446
1996	2589
1997	2562
1998	2710
1999	2627
2000	2184
2001	2474

Table 5.4-4: Summary of Specific Life Stage EFH Designations for Species in the NMFS Designated 10 x 10 Minute Squares Encompassing the Proposed Site in Nantucket Sound.

SPECIES	EGGS	LARVAE	JUVENILES	ADULTS	SPAWNING ADULTS
Atlantic cod				X	
Scup			X	X	
Black sea bass		X	X	X	
Winter flounder	X	X	X	X	X
Summer flounder	X	X	X	X	
Windowpane				X	X
Yellowtail flounder			X		
Atlantic butterfish	X	X	X	X	
Atlantic mackerel	X	X	X	X	
King mackerel	X	X	X	X	
Spanish mackerel	X	X	X	X	
Cobia	X	X	X	X	
Blue shark				X	
Shortfin mako shark			X		
Bluefin tuna			X	X	
Little skate			X	X	
Winter skate			X	X	
Long-finned squid			X	X	
Short-finned squid			X	X	
Surf clam			X	X	

Table 5.4-5: Summary of Studies on Acoustic Impacts to Fish

Species	Noise Level / Frequency	Sound Category	Effect	Source
Gouramis (*Trichogaster* sp.) and goldfish (*Carassius auratus*)	229 dB re 1 µPa	transient	lethal	Hastings (1995)
Gouramis (*Trichogaster* sp.) and goldfish (*Carassius auratus*)	192 to 204 dB re 1 µPa	continuous	lethal	Hastings (1995)
Cod (*Gadus morhua*)	180 dB re 1 µPa	continuous for one to five hours	permanent damage to ciliary bundles	Enger (1981)
Goldfish (*Carassius auratus*)	182 to 204 dB re 1 µPa	continuous for two hours	permanent sensory cell damage	Hastings (1986, 1987)
Fathead minnow (*Pimephales promelas*)	142 dB re 1 µPa, 0.3 and 4 kHz for one hour	continuous for one hour	increased auditory threshold	Scholik &Yan (2001)
European sea bass (*Dicentrarchus labrax*)	underwater air gun explosions, level unknown	transient at various distances	including increases in cortisol, glucose, and lactate serum levels	Santulli *et al.*(1999)
Japanese anchovies (*Engraulis japonicus*)	146 and 154 dB re 1 µPa and 100 and 600 Hz frequencies	n/a	startle response	Akamatsu *et al.,* (1996)

Table 5.7-1: Aerial Survey Coverage and Percentage of Each Alternative Site Flown During all Systematic Surveys

Shoal	Area of Shoal (km^2 / mi^2)	Area Surveyed (Km^2 / mi^2)	% Area Surveyed
Horseshoe	110 (42.5)	21.0 (8.1)	19%
Monomoy-Handkerchief	52 (20.1)	9.8 (3.8)	19%
Tuckernuck	89 (34.4)	16.8 (6.5)	19%
OUTSIDE	582 (224.7)	120.4 (46.5)	21%
TOTAL	834 (322.0)	168.0 (64.9)	20%

Table 5.7-2: Summary of Dates, Times, Weather and Water Conditions during the 46 Aerial Surveys in Nantucket Sound, 2002-2004.

Survey	Date	Start	Finish	Start Point[1]	High Tide[2]	Wind[3]	Temp °F	Weather
1	17-Mar-02	12:31	15:31	1 South	19:34	NW 8 Knots	40s	Sunny
2	19-Mar-02	10:27	13:32	16 South	20:54	NE 7-11 Knots	40s	Slight Drizzle
3	25-Mar-02	11:13	14:14	16 North	14:19	NE 9 Knots	40s	Overcast
4	29-Mar-02	6:07	9:07	16 North	17:43	0 Knots	up 40s	Partly Cloudy
5	5-Apr-02	14:32	17:28	1 North	11:46	N 6 Knots	mid 40s	Partly Cloudy
6	22-May-02	5:15	9:45	16 South	8:51	NNW 8 Knots	52	Sunny
7	24-Jun-02	9:40	14:17	1 South	12:24	NW 11-16 Knots	mid 60s	Sunny
8	25-Jul-02	7:00	11:20	16 North	13:43	NW 25 Knots	low 70s	Sunny
9	6-Aug-02	14:50	19:30	16 North	10:46	NW 20-35 Knots	70s	Sunny
10	26-Aug-02	6:30	10:41	2 South	15:08	NE 3-7 Knots	70s	Clear
11	30-Aug-02	16:15	19:10	2 North	17:55	NE 10 knots	low 70s	Overcast
12	25-Sep-02	14:40	19:00	1 North	15:08	NNE 8-18 Knots	mid 60s	Clear
13	8-Oct-02	14:30	18:28	1 South	13:56	NNE 6-15 Knots	high50s	Clear
14	21-Oct-02	14:25	18:40	1 North	12:50	NW 10 Knots	mid 50s	Clear
15	20-Nov-02	13:15	17:50	16 North	15:22	0-5 Knots	low 50s	Hazy
16	25-Nov_02	6:15	10:49	16 South	17:55	0-2 Knots	low 30s	Clear
17	13-Dec-02	6:30	10:49	16 North	7:03	0 knots	high30s	Clear
18	27-Dec-02	6:50	11:05	16 North	5:33	NNW 13-21 Knots	high20s	Clear
19	6-Jan-03	9:27	13:27	16 North	14:20	NNE 4-8 Knots	high 20s	Overcast/Snow
20	12-Jan-03	8:28	12:52	16 North	7:01	NNW 12-24 Knots	low 20s	Hazy
21	14-Feb-03	9:28	13:17	16 North	9:44	NW 16-21 Knots	mid teens	Cloudy
22	22-Feb-03	9:37	14:12	16 South	15:20	SW 10 Knots	Low 40s	Clear
23	17-Mar-03	14:40	19:00	1 North	12:31	NNE 8-18 Knots	mid 60s	Clear
24	24-Mar-03	4:18	18:28	16 South	17:02	NNE 6-15 Knots	high50s	Clear
25	18-Apr-03	14:25	18:40	16 South	14:01	NW 10 Knots	mid 50s	Clear
26	23-Apr-03	13:15	17:50	16 North	6:01	0-5 Knots	low 50s	Hazy
27	12-May-03	6:15	10:49	16 North	9:09	0-2 Knots	low 30s	Clear
28	2-Jun-03	15:49	20:00	16 North	14:38	NW 6-16 knots	low to mid 50s	Bright/clear
29	16-Jun-03	09:46	13:54	1 North	14:22	NE 12-20 Knots3	low 60s	Mostly Cloudy
30	26-Jun-03	05:06	09:11	1 North	10:40	NNE 0-4 Knots	mid 70s	Clear
31	9-Jul-03	08:40	12:56	16 North	08:21	NW 6-9 Knots	high 70s	Clear
32	29-Jul-03	07:30	11:56	16 North	13:07	ENE 6-12 Knots	mid 60s	Light Rain
33	20-Aug-03	14:19	18:46	16 North	6:37	N 0-4 Knots	high 70s	Clear
34	29-Aug-03	07:06	12:04	1 South	13:59	SE 9 knots	mid 70s	Clear
35	15-Sep-03	8:49	13:28	1 North	15:51	SE 10-12 Knots	high 60s	Overcast
36	22-Sep-03	8:36	13:10	1 North	9:42	NE 4-6 Knots	low 70's	Clear
37	17-Oct-03	8:27	12:16	15 North	5:25	WNW 4-7 Knots	mid 50's	Clear
38	31-Oct-03	8:18	12:12	16 South	4:17	SSE 5-10 Knots	high 50's	Clear
39	19-Nov-03	8:08	12:20	16 North	7:25	SSE 12-22 Knots	mid 50's	Overcast
40	24-Nov-03	11:33	15:24	16 North	11:34	ESE 7-10 Knots (later SSE 8-12 Knots)	mid 40's	Overcast
41	5-Dec-03	7:17	11:21	16 South	9:31	NNE 7-10 Knots	high 20s	Clear
42	14-Dec-03	8:14	12:19	16 South	15:32	E 6-11 Knots	low 30's	Clear

43	9-Jan-04	10:24	14:21	16 South	13:00	NNW 18-25 Knots	10-11F	Clear
44[4]	2-Feb-04	10:44	14:51	16 North	9:03	ENE 3-9 Knots	mid 30's	Clear
45	20-Feb-04	12:44	17:55	16 North	11:46	E (SW later) 5-10 Knots	mid 30's	Clear
46	27-Feb-04	12:17	18:15	16 North	17:17pm	NNE 12-20 Knots (later NW 4 Knots)	high 30's	Clear

1. Start Point refers to transect (Fig. 5.7-1). 2. High Tide data for Cape Poge, Chappaquiddick Island, Massachusetts (www.harbortides.com).
3. 1 knot = 1.85 km/h. 4. ice covered 80% of Nantucket Sound

Table 5.7-3: Bird Species Observed in the Study Area from March 2002 through June 2003

Common Name*	Scientific Name*	Surveys Observed	Total Individuals Observed
Red-throated Loon, Common Loon	*Gavia stellata, Gavia immer*	1,2,3,4,5,6,7	8,844
Grebe	*Podiceps sp.*	1,3,5,7	319
Sooty Shearwater	*Puffinus griseus*	2,3,4,6	10
Wilson's Storm-Petrel	*Oceanites oceanicus*	2,4,5,6	44
Northern Gannet	*Morus bassanus*	1,2,3,4,5,7	2,052
Great & Double-crested Cormorant	*Phalacrocorax carbo, P. auritus*	1,2,3,4,5,6,7	2,734
Mute Swan	*Cygnus olor*	7	1
Brant	*Branta bernicla*	7	7
Canada Goose	*Branta canadensis*	3,6	35
American Black Duck	*Anas rubripes*	7	109
Greater Scaup	*Aythya marila*	5	14
Common Eider	*Somateria mollissima*	1,2,3,5,6,7	111,067
Long-tailed Duck	*Clangula hyemalis*	1,2,3,5,7	54,242
Black Scoter	*Melanitta nigra*	1,2,3,4,5,6,7	212,872
Surf Scoter	*Melanitta perspicillata*	1,2,3,4,5,6,7	
White-winged Scoter	*Melanitta fusca*	1,2,3,4,5,6,7	
Goldeneye	*Bucephala sp*	1,2,6,7	8
Red-breasted Merganser	*Mergus serrator*	1,3,5,7	1,452
Osprey	*Pandion haliaetus*	2,7	8
American Oystercatcher	*Haematopus palliatus*	6	1
Redknot	*Calidris canutus*	4	1
Sandpiper	*Calidris spp.*	4	6
Dunlin	*Calidris alpina*	3	20
Parasitic Jaeger	*Stercorarius parasiticus*	7	4
Laughing Gull	*Larus atricilla*	1,2,3,4,6,7	150
Bonaparte's Gull	*Larus philadelphia*	1,3,7	1,444
Ring-billed Gull	*Larus delawarensis*	2,3	2
Herring Gull**	*Larus argentatus*	1,2,3,4,5,6,7	1,605
Great Black-backed Gull**	*Larus marinus*	1,2,3,4,5,6,7	2,220
Black-legged Kittiwake	*Rissa tridactyla*	1,3,7	319
Roseate Tern***	*Sterna dougallii*	2,3,4,5,6,7	447
Common Tern***	*Sterna hirundo*	1,2,3,4,5,6,7	5,313
Forster's Tern	*Sterna forsteri*	7	2
Least Tern	*Sterna antillarum*	2,5,6	198
Black Tern	*Chlidonias niger*	7	40
Dovekie	*Alle alle*	2,3,5,7	50
Razorbill	*Alca torda*	1,2,3,5,7	3,530
Atlantic Puffin	*Fratercula arctica*	1	1
Swallow	*Hirundinidae sp.*	2,4	2
American Goldfinch	*Carduelis tristis*	1	1
Total			412,418

1. Five Aerial Surveys and one Boat Survey conducted from March 17 - April 18, 2002 (Appendix 5.7-D)
2. Six aerial and seven boat surveys conducted from May 1 –August 30, 2002 (Appendix 5.7-F)
3. Eleven aerial and two boat surveys conducted from September 25, 2002 – February 21, 2003 (Appendix 5.7-G)
4. Ground-truthing (boat-based and land-based) (Appendix 5.7-F)
5. Six aerial surveys and one boat survey conducted from March 19- June 2, 2003 (Appendix 5.7-K)
6. Six aerial surveys and two boat surveys conducted from June 16, 2003 through August 29, 2003 (Appendix 5.7-L)
7. Twelve aerial surveys and one boat survey conducted from September 15, 2004 through February 27, 2004 (Appendix 5.7-M)

Some loons and cormorants not identified to species.
* Species listed in taxonomic order. **Unknown gull – 489 individuals. ***Mixed Terns: Roseate-Common-Black Tern – 2,755 individuals.

Table 5.7-4: Species Totals: Individuals Recorded within the Study Area during Forty-Six Aerial Surveys

Common Name	3/17/02	3/19/02	3/25/02	3/29/02	4/5/02	5/22/02	6/24/02	7/25/02	8/6/02	8/26/02	8/30/02	9/25/02
Red-throated Loon	124	138	191	782	2,004	77	2	4	0	0	0	3
Common Loon												
Grebe	0	0	0	0	2	0	0	0	0	0	0	0
Sooty Shearwater	0	0	0	0	0	0	0	0	0	0	0	0
Wilson's Storm-Petrel	0	0	0	0	0	0	1	5	1	6	0	0
Northern Gannet	28	100	27	82	123	89	0	0	0	0	0	0
Great Cormorant	0	0	9	0	1	1	41	0	83	52	116	201
Double-crested Cormorant												
Canada Goose	0	0	0	0	0	0	0	0	0	0	0	0
Greater Scaup	0	0	0	0	0	0	0	0	0	0	0	0
Mute Swan	0	0	0	0	0	0	0	0	0	0	0	0
Brant	0	0	0	0	0	0	0	0	0	0	0	0
American Black Duck	0	0	0	0	0	0	0	0	0	0	0	0
Common Eider	4,359	2,885	3,347	4,904	5,125	100	0	0	30	0	51	40
Long-tailed Duck	1,261	1,234	1,857	3,230	3,493	0	0	0	0	0	0	0
Black Scoter	5,049	6,769	9131	8389	11744	9	2	0	0	0	7	54
Surf Scoter												0
White-winged Scoter												0
Goldeneye	0	2	1	0	1	0	0	1	0	0	0	0
Red-breasted Merganser	2	0	6	10	22	0	0	0	0	0	0	0
American Oystercatcher	0	0	0	0	0	0	0	0	0	0	0	0
Dunlin	0	0	0	0	0	0	0	0	0	0	0	0
Laughing Gull	0	0	0	0	0	0	0	0	0	2	0	0
Bonaparte's Gull	0	0	0	0	57	0	0	0	0	0	0	0
Ring-billed Gull	0	0	0	0	0	0	0	1	0	0	0	1
Herring Gull	21	1	9	19	54	22	5	15	67	47	2	5
Great Black-backed Gull	58	16	6	5	0	114	29	53	4	36	13	18
Unknown Gull	0	0	2	1	14	0	0	0	0	0	0	0
Black-legged Kittiwake	17	1	0	0	0	0	0	0	0	0	0	0
Roseate Tern	0	0	0	0	0	16	12	15	23	31	16	7
Common Tern	0	0	0	0	0	209	38	253	252	202	62	27
Least Tern	0	0	0	0	0	0	0	0	67	0	1	0
Forster's Tern	0	0	0	0	0	0	0	0	0	0	0	0
Common/Roseate/Black Tern Type	0	0	0	0	0	0	7	1	76	172	314	0
Dovekie	0	0	0	0	0	0	0	0	0	0	0	0
Razorbill	59	20	86	129	268	0	1	0	0	0	0	0
Atlantic Puffin	0	1	0	0	0	0	0	0	0	0	0	0
Totals	10978	11167	14672	17551	22908	637	138	348	603	548	582	356

Common Name	10/8/02	10/21/02	11/20/02	11/25/02	12/13/02	12/27/02	1/6/03	1/12/03	2/14/03	2/21/03
Red-throated Loon	25	83	371	370	444	121	92	80	57	217
Common Loon										
Grebe	0	0	0	0	20	22	20	25	4	6
Sooty Shearwater	0	0	0	0	0	0	0	0	0	0
Wilson's Storm-Petrel	0	0	0	0	0	0	0	0	0	0
Northern Gannet	0	0	54	94	33	1	1	4	0	0
Great Cormorant	607	355	64	12	8	0	0	0	0	0
Double-crested Cormorant										
Canada Goose	0	0	0	0	25	0	0	0	0	0
Greater Scaup	0	0	0	0	0	0	0	0	0	0
Mute Swan	0	0	0	0	0	0	0	0	0	0
Brant	0	0	0	0	0	0	0	0	0	0
American Black Duck	0	0	0	0	0	0	0	0	0	0
Common Eider	303	2295	2890	4095	3024	2418	3026	4003	801	2223
Long-tailed Duck	136	60	10900	3086	3420	590	1183	1298	870	2172
Black Scoter	1261	4856	7145	4415	6322	4361	9153	5383	9813	2161
Surf Scoter										
White-winged Scoter										
Goldeneye	0	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	0	2	16	15	130	0	14	0	16	1
American Oystercatcher	0	0	0	0	0	0	0	0	0	0
Dunlin	0	20	0	0	0	0	0	0	0	0
Laughing Gull	1	0	0	3	0	0	0	0	0	0
Bonaparte's Gull	0	0	204	103	25	42	56	100	1	0
Ring-billed Gull	0	0	0	0	0	0	0	0	0	0
Herring Gull	28	8	66	32	133	39	49	42	32	22
Great Black-backed Gull	90	1	13	35	99	42	21	11	26	3
Unknown Gull	7	0	7	16	31	180	92	31	2	0
Black-legged Kittiwake	0	0	0	0	23	0	12	34	0	1
Roseate Tern	0	0	0	0	0	0	0	0	0	0
Common Tern	0	0	0	0	0	0	0	0	0	0
Least Tern	0	0	0	0	0	0	0	0	0	0
Forster's Tern	0	0	0	0	0	0	0	0	0	0
Common/Roseate/Black Tern Type	0	0	0	0	0	0	0	0	0	0
Dovekie	0	0	0	0	0	0	19	3	0	8
Razorbill	0	0	73	72	285	183	132	200	39	96
Atlantic Puffin	0	0	0	0	0	0	0	0	0	0
Totals	2458	7680	21803	12348	14022	7999	13870	11214	11661	6910

Common Name	3/17/03	3/24/03	4/18/03	4/23/03	5/12/03	6/2/03	6/16/03	6/26/03	7/9/03	7/29/03	8/20/03	8/29/03	9/15/03
Red-throated Loon	119	495	253	649	187	50	0	0	0	0	0	0	3
Common Loon							2	11	5	3	6	4	
Grebe	18	57	24	18	5	2	0	0	0	0	0	0	0
Sooty Shearwater	0	0	0	0	0	0	0	1	0	0	0	0	0
Wilson's Storm-Petrel	0	0	0	0	0	1	2	12	0	1	0	0	0
Northern Gannet	5	6	43	295	121	3	0	0	0	0	0	0	0
Great Cormorant	2	0	8	9	1	94	0	0	0	0	0	0	5
Double-crested Cormorant							78	216	188	132	55	75	
Canada Goose	0	0	0	0	0	0	10	0	0	0	0	0	0
Greater Scaup	0	0	0	0	0	14	0	0	0	0	0	0	0
Mute Swan	0	0	0	0	0	0	0	0	0	0	0	0	0
Brant	0	0	0	0	0	0	0	0	0	0	0	0	0
American Black Duck	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Eider	5,687	13,790	1,900	610	6	0	6	0	5	0	0	0	0
Long-tailed Duck	1,664	2,870	267	62	0	0	0	0	0	0	0	0	0
Black Scoter	2,693	5,438	2,317	2540	595	8	4	0	0	0	0	0	2
Surf Scoter								0	0	0	0	0	
White-winged Scoter								0	0	0	0	0	
Goldeneye	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	43	80	20	23	0	0	0	0	0	0	0	0	0
American Oystercatcher	0	0	0	0	0	0	0	0	1	0	0	0	0
Dunlin	0	0	0	0	0	0	0	0	0	0	0	0	0
Laughing Gull	0	0	0	0	0	0	0	0	0	0	0	0	0
Bonaparte's Gull	0	0	0	0	0	0	0	0	0	0	0	0	0
Ring-billed Gull	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull	17	25	1	32	9	27	11	20	26	7	5	5	22
Great Black-backed Gull	15	6	17	32	69	41	47	319	60	36	6	21	75
Unknown Gull	1	0	0	0	0	30	0	0	0	0	0	0	0
Black-legged Kittiwake	0	0	0	0	0	0	0	0	0	0	0	0	0
Roseate Tern	0	0	0	0	81	13	0	2	4	3	6	8	3
Common Tern	0	0	2	15	246	57	4	16	52	47	19	24	26
Least Tern	0	0	0	0	2	1	2	4	1	0	1	4	0
Forster's Tern	0	0	0	0	0	0	0	0	0	0	0	0	0
Common/Roseate/Black Tern Type	0	0	0	0	197	107	0	3	0	22	1	0	46
Dovekie	3	0	2	0	0	0	0	0	0	0	0	0	0
Razorbill	117	433	173	270	0	0	0	0	0	0	0	0	0
Atlantic Puffin	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10384	23200	5027	4555	1519	448	166	604	342	251	99	141	182

Common Name	9/22/03	10/17/03	10/31/03	11/19/03	11/24/03	12/5/03	12/14/03	1/9/04	2/2/04	2/20/04	2/27/04	Total
Red-throated Loon Common Loon	4	32	125	135	268	267	103	73	25	117	108	8229
Grebe	0	1	6	12	3	9	27	5	1	17	10	314
Sooty Shearwater	0	0	0	0	0	0	0	0	0	0	0	1
Wilson's Storm-Petrel	0	0	0	0	0	0	0	0	0	0	0	29
Northern Gannet	0	0	4	126	153	10	4	8	0	0	1	1,415
Great Cormorant Double-crested Cormorant	23	30	25	7	12	0	0	0	0	1	0	2511
Canada Goose	0	0	0	0	0	0	0	0	0	0	0	35
Greater Scaup	0	0	0	0	0	0	0	0	0	0	0	14
Mute Swan	0	1	0	0	0	0	0	0	0	0	0	1
Brant	0	0	0	0	0	0	0	0	7	0	0	7
American Black Duck	1	20	0	0	34	0	54	0	0	0	0	109
Common Eider	0	1519	3259	1827	2924	2571	2776	7142	2257	5163	13194	110,555
Long-tailed Duck	0	94	887	1691	1565	1234	662	695	2002	2388	1321	52,192
Black Scoter Surf Scoter White-winged Scoter	66	13813	9811	14857	16615	10605	11336	7499	2733	6124	2722	205,802
Goldeneye	0	0	0	0	0	0	0	1	0	0	0	6
Red-breasted Merganser	0	8	28	308	204	177	205	42	54	12	14	1,452
American Oystercatcher	0	0	0	0	0	0	0	0	0	0	0	1
Dunlin	0	0	0	0	0	0	0	0	0	0	0	20
Laughing Gull	0	0	1	0	0	0	0	0	0	0	0	7
Bonaparte's Gull	0	0	12	153	413	39	126	13	0	2	3	1,349
Ring-billed Gull	0	0	0	0	0	0	0	0	0	0	0	2
Herring Gull	32	6	191	97	40	58	31	29	19	18	12	1,458
Great Black-backed Gull	84	6	40	70	35	67	28	16	7	54	32	1,876
Unknown Gull	40	0	0	0	0	2	1	0	3	3	26	489
Black-legged Kittiwake	0	0	0	25	14	6	66	118	2	0	0	319
Roseate Tern	0	0	0	0	0	0	0	0	0	0	0	240
Common Tern	16	1	5	35	0	0	0	0	0	0	0	1,608
Least Tern	0	0	0	0	0	0	0	0	0	0	0	83
Forster's Tern	0	0	1	0	0	0	0	0	0	0	0	1
Common/Roseate/Black Tern Type	10	0	0	0	0	0	0	0	0	0	0	956
Dovekie	0	0	0	0	1	3	0	2	5	1	1	48
Razorbill	0	6	7	16	19	93	206	31	67	132	242	3,455
Atlantic Puffin	0	0	0	0	0	0	0	0	0	0	0	1
Totals	276	15537	14402	19359	22300	15141	15625	15674	7182	14032	17686	394,585

Table 5.7-5: Species Totals: Individuals Recorded within the Study Area during the Boat Surveys

Common Name	April 17/18, 02	5/1/02	6/19/02	7/1/02	7/26/02	8/1/02	8/15/02	8/22/02	Oct 22/24, 02	4/25/03	July 31/Aug 27, 03	9/12/03	Total
Red-throated Loon	93	48	0	0	0	0	0	0	2	37	0	0	588
Common Loon	335		0	0	0	0	0	0	16	55	1	1	
Grebe	5	0	0	0	0	0	0	0	0	0	0	0	5
Sooty Shearwater	0	0	0	0	0	0	0	1	1	0	0	0	2
Wilson's Storm-Petrel	0	0	6	0	2	2	1	0	0	0	1	0	12
Northern Gannet	309	139	0	0	0	0	0	0	0	132	0	0	580
Double-crested Cormorant	3	2	0	0	4	6	54	51	1	12	35	33	201
Common Eider	279	0	0	0	0	0	0	0	77	155	1	0	512
Long-tailed Duck	1,947	18	0	0	0	0	0	0	19	66	0	0	2050
Black Scoter	670	872	0	0	0	0	0	0	15	221	0	0	6321
Surf Scoter	2,321								47	640	0	0	
White-winged Scoter	1,032								408	92	0	3	
UnKnown Scoter	44	0	0	0	0	0	0	0	171	439	0	0	654
Goldeneye	0	0	0	0	0	1	0	0	0	0	1	0	2
Red-breasted Merganser	0	0	0	0	0	0	0	0	0	0	0	0	0
Osprey	0	0	0	0	0	0	2	5	0	0	0	1	8
Laughing Gull	1	0	0	0	0	0	0	0	0	0	134	0	135
Bonaparte's Gull	95	0	0	0	0	0	0	0	0	0	0	0	95
Herring Gull	81	24	0	0	0	3	0	0	4	4	4	14	134
Great Black-backed Gull	162	118	0	0	4	2	0	0	0	20	5	15	326
Roseate Tern	0	7	2	0	129	47	8	4	0	0	1	1	199
Common Tern	19	156	12	15	117	174	158	66	0	0	821	1679	3217
Least Tern	0	0	51	0	0	5	4	52	0	0	3	0	115
Forster's Tern	0	0	0	0	0	0	0	0	0	0	0	1	1
Black Tern	0	0	0	0	0	0	0	0	0	0	0	40	40
Common/Roseate/Black Tern Type	0	0	100	0	60	464	756	0	0	0	285	12	1677
Dovekie	0	2	0	0	0	0	0	0	0	0	0	0	2
Razorbill	71	0	0	0	0	0	0	0	0	4	0	0	75
Parasitic Jaeger	0	0	0	0	0	0	0	0	0	0	0	4	4
Swallow	0	0	0	0	0	0	1	0	0	0	0	0	1
American Goldfinch	1	0	0	0	0	0	0	0	0	0	0	0	1
Totals	7468	1386	171	15	316	704	984	179	761	1877	1292	1804	16957

Table 5.7-6: Species Totals: Individuals Recorded within the Study Area during the Ground-truthing

Common Name	5/10/02	5/17/02	5/20/02	5/24/02	5/28/02	5/29/02	6/3/02	6/4/02	6/6/03	9/5/02	9/13/02	9/18/02	9/30/02	Total
Red-throated Loon	1	11	7	0	0	0	5	2	0	0	1	0	0	27
Sooty Shearwater	0	0	0	1	0	0	0	5	1	0	0	0	0	7
Wilson's Storm-Petrel	0	0	0	0	0	0	0	0	3	0	0	0	0	3
Northern Gannet	18	30	4	2	0	0	2	0	1	0	0	0	0	57
Double-crested Cormorant	0	0	0	0	0	0	1	0	2	1	7	2	9	22
Black Scoter	4	17	4	0	0	0	0	0	0	1	14	12	43	95
Red Knot	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Sandpiper	0	0	0	0	0	0	0	0	0	0	6	0	0	6
Laughing Gull	0	0	0	0	0	0	0	0	0	0	8	0	0	8
Herring Gull	0	4	0	0	0	0	0	0	0	0	5	4	0	13
Great Black-backed Gull	0	1	0	0	1	0	1	0	0	0	11	2	2	18
Roseate Tern	1	0	2	4	0	0	0	0	0	1	0	0	0	8
Common Tern	40	75	68	114	1	2	11	21	22	18	93	23	0	488
Common/Roseate Tern Type	0	0	0	0	0	0	0	0	111	11	0	0	0	122
Swallow	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Total	64	138	85	121	2	2	20	28	140	33	146	43	54	876

Table 5.7-7: Percentage of Seaducks Observed in Each Shoal Area during March 2002 through February 2004 Aerial Surveys

Seaduck Distribution During Aerial Surveys		
	2002-2003 (%)	Study Area* (%)
Horseshoe Shoal	6.8	13
Monomoy-Handkerchief Shoal	6.0	6
Tuckernuck Shoal	9.2	11
Outside	77.9	70

*Study Area denotes the percentage of the study area encompassed by each shoal area and also the expected percentage of seaducks in each area if seaducks were evenly distributed.

Table 5.7-8: Percentage of Terns Observed in Each Shoal Area during March 2002 through February 2004 Aerial Surveys

Tern Distribution During Aerial Surveys		
	2002-2003 (%)	Study Area* (%)
Horseshoe Shoal	9.5	13
Monomoy-Handkerchief Shoal	2.6	6
Tuckernuck Shoal	5.7	11
Outside	82.1	70

*Study Area denotes the percentage of the study area encompassed by each shoal area and also the expected percentage of terns in each area if terns were evenly distributed.

Table 5.8-1:Coastal Wetland Resources

Wetland	Jurisdiction			Significant MWPA Interests	Impacts	Mitigation
	Federal	State	Local			
Coastal Wetland Resource Areas						
Lewis Bay	Yes	• Land Under Ocean • Nearshore Areas • Land Containing Shellfish	• Land Under Ocean • Land Containing Shellfish • 100' Buffer Zone	• Protection of Marine Fisheries • Protection of Land Containing Shellfish • Flood Control • Storm Damage Prevention • Wildlife Habitat	Installation of transmission line by hydraulic jet-plow	• Minimization of impacts through use of hydraulic jet-plow
Coastal Bank	No	• Coastal Bank • 100' Buffer Zone	• Coastal Bank • 100' Buffer Zone • 50' No-Build Zone • 35' Vegetated Buffer	• Flood Control • Storm Damage Prevention	HDD beneath Coastal Bank and temporary work (trenching, installing vault and transmission line, backfilling and repaving) within paved portions of 100' Buffer Zone	• No direct impacts through use of HDD at landfall • No above-ground structures in 50' No-Build Zone and no vegetation disturbance in 35' Vegetated Buffer • Erosion and sedimentation controls (coffer-dam)
100-year Floodplain	No	• Land Subject to Coastal Storm Flowage	• Land Subject to Coastal Storm Flowage	None Under WPA	Temporary work (trenching, installing vault and transmission line, backfilling, repaving) within paved roads	• No change to contours of land within floodplain or ability of floodplain to provide flood control
Coastal Beach	No	• Coastal Beach • 100' Buffer Zone • Land Containing Shellfish	• Coastal Beach, • Land Containing Shellfish • 100' Buffer Zone • 50' No-Build Zone • 35' Vegetated Buffer	• Storm Damage Prevention • Flood Control • Wildlife Habitat • Protection of Marine Fisheries • Protection of Land Containing Shellfish	HDD beneath Coastal Beach 1 and temporary work (trenching, installing vault and transmission line, backfilling, repaving) within paved portions of 100' Buffer Zone	• No direct impacts through use of HDD at landfall • No structures in 50' No-Build Zone and no disturbance of vegetation in 35' Vegetated Buffer • Erosion and sedimentation controls (coffer-dam)
Salt Marsh	Yes	• Salt Marsh • 100' Buffer Zone	• Salt Marsh • 100' Buffer Zone • 50' No-Build Zone • 35' Vegetated Buffer	• Protection of Marine Fisheries • Wildlife Habitat • Protection of Land Containing Shellfish • Storm Damage Prevention • Prevention of Pollution • Ground Water Supply	Temporary work (trenching, installing vault and transmission line, backfilling, repaving) within paved portions of 100' Buffer Zone	• No work in salt marsh, its 50' No-Build Zone or 35' Vegetated Buffer • Erosion and sedimentation controls
Land Subject to Tidal Action	No	• Land Subject to Tidal Action	• Land Subject to Tidal Action, • 100' Buffer Zone	None Under WPA	HDD beneath Land Subject to Tidal Action and temporary work within paved portions of 100' Buffer Zone	• No direct impacts through use of HDD at landfall • Erosion and sedimentation controls (coffer-dam)

Table 5.8-2: Freshwater Wetland Resources

Wetland	Jurisdiction			Significant MWPA Interests	Impacts	Mitigation
	Federal	State	Local			
Inland Wetland Resource Areas						
1	Yes	• BVW • Bank • 100' Buffer Zone	• Vegetated Wetland • 100' Buffer Zone • 50' No-Build Zone • 35' Vegetated Buffer	• Public/Private Water Supply • Ground Water Supply • Flood Control • Storm Damage Prevention • Prevention of Pollution • Wildlife Habitat	Temporary work (trenching, installing ductbanks and transmission line, backfilling, repaving) within paved portions of 100' Buffer Zone	• No structures in 50' No-Build Zone and no work in 35' Vegetated Buffer • Erosion and sedimentation controls
2	Yes	• Bank • LUWW • BVW • 100' Buffer Zone • Riverfront Area	• Bank • LUWW • Vegetated Wetland • 100' Buffer Zone • 50' No-Build Zone • 35' Vegetated Buffer	• Public/Private Water Supply • Ground Water Supply • Flood Control • Storm Damage Prevention • Prevention of Pollution • Protection of Fisheries • Wildlife Habitat	Temporary work (trenching, installing ductbanks and transmission line, backfilling, repaving) within paved portions of 100' Buffer Zone and 200' Riverfront Area	• No structures in 50' No-Build Zone and no disturbance of vegetation in 35' Vegetated Buffer • Erosion and sedimentation controls
3	Yes	• BVW • Bank • 100' Buffer Zone	• Vegetated Wetland • 100' Buffer Zone • 50' No-Build Zone • 35' Vegetated Buffer	• Public/Private Water Supply • Ground Water Supply • Flood Control • Storm Damage Prevention • Prevention of Pollution • Protection of Fisheries • Wildlife Habitat	Temporary work (trenching, installing ductbanks and transmission line, backfilling, repaving) within paved portions of 100' Buffer Zone	• No structures in 50' No-Build Zone and no disturbance of vegetation in 35' Vegetated Buffer • Erosion and sedimentation controls
4	Yes	• BVW • 100' Buffer Zone	• Vegetated Wetland • 100' Buffer Zone • 50' No-Build Zone • 35' Vegetated Buffer	• Public/Private Water Supply • Ground Water Supply • Flood Control • Storm Damage Prevention • Prevention of Pollution • Wildlife Habitat	Temporary work (trenching, installing ductbanks, splicing vault and transmission line, backfilling, repaving) within paved portions of 100' Buffer Zone	• No structures in 50' No-Build Zone and no work in 35' Vegetated Buffer • Erosion and sedimentation controls
5	Yes	• BVW • 100' Buffer Zone •	• Vegetated Wetland • 100' Buffer Zone • 50' No-Build Zone • 35' Vegetated Buffer	• Public/Private Water Supply • Ground Water Supply • Flood Control • Storm Damage Prevention • Prevention of Pollution • Protection of Fisheries • Wildlife Habitat	Temporary work (trenching, installing ductbanks and transmission line, backfilling, repaving) within paved portions of the 100' Buffer Zone	• No structures in 50' No-Build Zone and no disturbance of vegetation in 35' Vegetated Buffer • Erosion and sedimentation controls
6	Yes	• BVW • Bank • 100' Buffer Zone	• Vegetated Wetland • 100' Buffer Zone • 50' No-Build Zone • 35' Vegetated Buffer	• Public/Private Water Supply • Ground Water Supply • Flood Control • Storm Damage Prevention • Prevention of Pollution • Protection of Fisheries • Wildlife Habitat	No work within 100' Buffer Zone	• Erosion and sedimentation controls • Vegetative stabilization

Table 5.8-3: Impacts from Onshore Transmission Line

	Temporary Impacts		Permanent Impacts	
Resource Area	**Square Feet**	**Acres (Square Meters)**	**Square Feet**	**Acres (Square Meters)**
LSCSF	± 8,400	0.19 (768.9)	0	0
200' (61 m) Riverfront Area	± 3,360	0.08 (323.7)	0	0
100' (30.5 m) Buffer Zones	± 17,360	0.40 (1,618.7)	0	0
50' (15.2 m) No-Build Zones	± 5,300	0.12 (485.6)	0	0
35' (10.7 m) Vegetated Buffers	± 1,530	0.04 (161.9)	0	0

Table 5.10-1: Historic Properties and Districts Assessed For Wind Park Visibility For The Cape Wind Project (Note: Visual simulations were prepared for the shaded locations below)

Site, Location MHC No. (shown on Figure 5.10-1); Historic Designation	Field Visit	Potential Visibility Of WP	Viewpoint Distance to WP	Visual Simulation
CAPE COD				
Town of Falmouth				
Nobska Point Light Station, Woods Hole FAL.LF (S/NRHP)	Yes	Yes	VP 1 14.1 Miles ESE	Yes
Woods Hole Historic District Near Little Harbor, Woods Hole; FAL.AL (local)	Yes	Limited	VP 2 14.6 Miles ESE	No
Woods Hole School, 24 School Street; Woods Hole; FAL.428 (S/NRHP)	Yes	No	VP 3 14.7 Miles ESE	No
East Falmouth Historic District at 481 Davisville Road; Falmouth; FAL.AF (local)	Yes	No	VP 4 9.9 Miles ESE	No
Town of Barnstable				
Cotuit Historic District (1) At 249 Ocean View Avenue; Cotuit BRNK.HD (S/NRHP)	Yes	Yes	VP 5 6.1 Miles SE	Yes
Col. Charles Codman Estate 43 Ocean Avenue, Cotuit; BRN.367 (S/NRHP)	No: Posted	Expected	6.3 Miles SSE	Yes Same as above
Wianno Historic District(1) At 71 Seaview Avenue, Osterville; BRN.J (S/NRHP)	Yes	Yes	VP 6 5.7 Miles SSE	Yes
Wianno Club, Historic Property 107 Seaview Avenue, Osterville; BRN.769 (S/NRHP)	Yes	Yes	VP 6 5.7 Miles SSE	Yes Same as above
Centerville Historic District(1) Main Street, between Church Hill Rd and Briarcliff Lane BRN.X (S/NRHP)	Yes	No	7.5 Miles SSW	No
Craigville Area At 6 Butler Avenue, Craigville No visibility within Historic District BRN.I (S/NRHP)(1)	Yes	Yes	VP 7 7.0 Miles SSE	Yes
Hyannis Port Historic District (shoreline)(1) At 61 Scudder Avenue; BRN.E (S/NRHP)	Yes	Yes	VP 8 6.2 Miles S	Yes
Kennedy Compound, Erving and Merchant Avenues, BRN.AJ (S/NRHP); National Historic Landmark	No: Posted	Expected	Similar to VP 8	See VP 8
Hyannis Port Historic District (elevated) BRN.E (S/NRHP)	Yes	Yes	VP 9 6.4 Miles SSE	No
Hyannis Main Street Waterfront District, Main, North and South Streets; BRN.AD (Local, SRHP)	Yes	No	7.9 Miles SSW	No
Capt. Alexander Crocker House 358 Sea Street, Hyannis; BRN.607; (S/NRHP)	Yes	No	VP 10 6.7 Miles SSE	No
Town of Yarmouth				
South Yarmouth/Bass River Historic District(1) at 162 Old Main Street, South Yarmouth; YAR.H (S/NRHP)	Yes	No	VP 11 8.9 Miles SSW	No
Yarmouth Campground Historic District, YAR.B (S/NRHP)	Yes	No	9.5 Miles S	No
Judith Baker Windmill River Street at Willow Street; YAR.901 (S/NRHP)	Yes	Limited	VP 12 8.7 Miles SSW	No
Town of Dennis				
West Dennis Grade School 67 School Street; DEN.283; (S/NRHP)	Yes	No	VP 13 9.8 Miles SW	No
Town of Harwich				
Capt. Berry House 37 Main Street; HRW.221; (S/NRHP)	Yes	No	VP 14 11.9 Miles SW	No

Site, Location MHC No. (shown on Figure 5.10-1); Historic Designation	Field Visit	Potential Visibility Of WP	Viewpoint Distance to WP	Visual Simulation
Wychmere Harbor Club/Snow Inn Not listed in MHC Inventory	Yes	Yes	VP 15 13.5 Miles SW	No[2]
South Harwich Methodist Church 270 Chatham Road; HRW.382; (S/NRHP)	Yes	No	VP 16 15.0 Miles WSW	No
Town of Chatham				
Chatham Light Station, Main Street CHA.LH (S/NRHP)	Yes	No	VP 17 18.9 Miles WSW	No
Chatham Historic Business District Main Street, Crowell and Stony Hill Roads; CHA.U (Local)	Yes	No	16.9 Miles SW	No
Old Village Historic District (shoreline) Along Bearses/Bridge Street CHA.W	Yes	Yes	VP 18 19.2 Miles WSW	No
Monomoy Point Light(1) Monomoy National Wildlife Refuge CHA.LS, CHA.92 (S/NRHP)	Yes	Yes	VP 26 14.9 Miles WSW	Yes (day only)
MARTHA'S VINEYARD				
Town of Edgartown				
Cape Poge Light(1) Chappaquiddick Island, EDG.900; (S/NRHP)	Yes	Yes	VP 19 5.4 Miles NE	Yes
Edgartown Village Historic District(1) Vicinity of Water Street and Pease's Point Way; EDG.A (S/NRHP)	Yes	Yes	VP 20 8.8 Miles NE	Yes
Edgartown Harbor Lighthouse(1) EDG.901 (S/NRHP)	Yes	Yes	See VP 20 8.7 Miles NE	Yes (see VP 20)
Town of Oak Bluffs				
Dr. Harrison A. Tucker Cottage 65 (formerly 42 Ocean Avenue) on Ocean Park OAK.637 (S/NRHP)	Yes	Yes	VP 21 9.4 miles ENE	Yes
Martha's Vineyard Campground Historic District(1) Lake, Siloam, Central, Circuit & Clinton Sts. & Court House; OAK.E (S/NRHP)	Yes	No	9.4 miles ENE	No
East Chop Lighthouse(1) at northern tip of East Chop; OAK.AA (S/NRHP)	Yes	Yes	See VP 21 9.5 Miles ENE	Yes (see VP 21)
Flying Horses Carousel (S/NRHP; NHL) 33 Oak Bluffs Avenue; OAK.621; OAK.91	Yes	No	9.4 miles ENE	No
The Arcade (S.NRHP) 31 (formerly 134) Circuit Avenue; OAK.593	Yes	No	9.4 miles ENE	No
Oak Bluffs Christian Union Chapel (S/NRHP) Circuit/Kennebec/Narragansett/Grove; OAK.326	Yes	No	9.4 miles ENE	No
Town of Tisbury				
West Chop Station at northern tip of West Chop; TIS.LH (S/NRHP)	No	Limited	See VP 21 11.0 Miles ENE	No
NANTUCKET ***(Historic District and National Historic Landmark, excepting Tuckernuck)***				
Nantucket Cliffs north of Village(1)	Yes	Yes	VP 22 13.6 Miles NNW	Yes
Crooked Record, 150 Main Street(1)	Yes	No	--	No
Nantucket Village(1)	Yes	No	--	No
Great Point	Yes	Yes	VP 23 11.2 Miles NW	Yes
Wauwinet(1)	Yes	Yes	15.3 Miles NW	See VP 23
Tuckernuck Island(1) (SRHP only)	Yes	Yes	VP 24 11.1 Miles N	Yes

Notes:

1. Included in MEPA Certificate on the ENF dated 4/22/02
2. Not a designated historic property, and therefore not simulated.

Shaded locations approved for visual simulation by USACE, MHC

Potential visibility of Wind Park determined based upon field observations at publicly available exterior areas, generally at or near ground level. Some Project visibility may be available from upper stories or roofs of buildings.

Abbreviations:

MHC No.: Massachusetts Historical Commission Site Number in MHC's *Inventory of Historic and Archaeological Assets of the Commonwealth*

S/NRHP= Listed or eligible for listing on the State and National Register of Historic Places

SRHP= Listed or eligible for listing on the State National Register of Historic Places

Local: Locally designated and listed on MHC's Inventory

WP= Wind Park

VP= Viewpoint

Table 5.10-2: Visual Simulation Locations for the Cape Wind Project

Site, Location, MHC No. (shown on Figure 5.10-1); Historic Designation	Viewpoint	Distance/Direction to Wind Park	Comments
CAPE COD			
Town of Falmouth			
Nobska Lighthouse; FAL.LF (S/NHRHP)	VP 1	14.1 miles ESE	Elevated
Town of Barnstable			
Cotuit Historic District At 249 Ocean View Avenue; Cotuit BRNK.HD (S/NRHP)	VP 5	6.1 miles SE	Elevated
Wianno Club and Wianno Historic District At 71 Seaview Avenue, Osterville; BRN.J S/NRHP)	VP 6	5.7 miles SSE	Shorefront
Craigville Area (elevated) At 6 Butler Avenue, Craigville; Outside of historic district BRN.I (S/NRHP)	VP 7	7.0 miles SSE	Elevated
Kennedy Compound & Hyannis Port Historic District, Erving and Merchant Avenues, BRN.AJ (S/NRHP)	VP 8	6.2 miles S	Shorefront
Town of Chatham			
Monomoy Point Light Monomoy National Wildlife Refuge CHA.LS, CHA.92 (S/NRHP)	VP 26	14.9 miles WSW	Shorefront
MARTHA'S VINEYARD			
Town of Oak Bluffs			
Near Dr. Harrison A. Tucker Cottage 65 (formerly 42) Ocean Avenue on Ocean Park; OAK 637 (S/NRHP)	VP 21	9.4 miles ENE	Representative View
Town of Edgartown			
Edgartown Village Historic District Vicinity of Water Street and Pease's Point Way; EDG.A (S/NRHP)	VP 20	8.8 miles NE	Representative View
Cape Poge Light(1) Chappaquiddick Island, EDG.900; (S/NRHP)	VP 19	5.4 miles NE	Shorefront
NANTUCKET			
Nantucket Historic District S/NRHP NHL	VP 22	13.6 miles NNW	Cliffs north of Town
Nantucket Historic District S/NRHP NHL	VP 23	11.2 miles NW	Great Point
Nantucket Historic District SRHP	VP 24	11.1 miles N	Tuckernuck Island

Abbreviations:
S/NRHP: Listed or eligible for listing on the State and National Registers of Historic Places
NHL: National Historic Landmark
SRHP: Listed on the State Register of Historic Places
Local: Locally designated historic property or district

Table 5.10-3: Viewpoint Data for the Cape Wind Project

Viewpoint #	Historic Property/District	Date	Time	Elevation*	Location	Weather (temps in F)
Cape Cod						
1	Nobska Lighthouse Town of Falmouth	1/22/03	11:53 a.m. 6:15 p.m.	50.7'	Nobska Road, Woods Hole	Windy, 18°, clear/some haze but limited to areas around islands.
5	Cotuit Historic District Town of Barnstable	1/22/03	1:47 p.m. 7:15 p.m.	4.8'	Ocean View Avenue, Cotuit Highlands	Windy, 19°, clear, partly cloudy on horizon, light haze
6	Wianno Historic District Town of Barnstable	1/22/03	3:30 p.m. 4:28 p.m. 9:45 p.m.	22.5'	Sea View Avenue, Wianno	Windy, 20°, low cloud cover on horizon, blue sky, strong low light
7	Craigville Area Town of Barnstable	1/21/03	1:10 p.m. 4:45 p.m. 9:00 p.m.	29.5'	#6 Butler Avenue	Cold, windy, partly clear and some haze on horizon
8	Hyannis Port Historic District Town of Barnstable	1/21/03	11:12 a.m. 4:30 p.m. 10:00 p.m.	19.3'	Scudder and Dale Avenue	Windy, 10°, low cloud cover on horizon, bright sun
26	Monomoy Lighthouse Town of Chatham	6/10/03	10:12 a.m.	30.0'	Bluffs near light house	Calm, 70 degrees, haze on horizon
Martha's Vineyard						
VP 21	Near Tucker Cottage Ocean Park Oak Bluffs	2/6/03	3:03 p.m. 6:42 p.m.	49.0'	Ocean and Sea View Avenues	Clear, Cold
VP 20	Village Historic Districts, Edgartown	2/6/03	10:49 a.m. 8:20 p.m.	30.6'	Lighthouse Beach near Water Street	Clear, Cold
VP 19	Cape Poge Lighthouse	2/5/03	2:14 p.m. 6:29 p.m.	51.6'	North Chappaquiddick Island	Clear, 34°
Nantucket						
VP 22	Nantucket Historic District	3/19/03	11:01 a.m. 8:56 p.m.	39.5'	Cliff Road	Clear, scattered clouds, 36°
VP 23	Nantucket Historic District	3/19/03	2:55 p.m. 7:13 p.m.	13.5'	Great Point Lighthouse	Clear, scattered clouds, 35°
VP 24	Nantucket Historic District	5/20/03	7:27 p.m. 7:57 p.m.	24.0'	Tuckernuck Island	Partly cloudy, clearing fog, 55°

*NAVD 88. Camera height is approximately 5 feet above ground surface.

Table 5.10.4 Compilation of Recreational Resources Within Viewshed of Wind Park (from West to East) see Figure 5.10-5

Map ID (Refer to Figure 3-38)	Resource Name	Description of Resource	Approximate Distance to WTG (Miles)	Representative Simulation
SOUTH SHORE OF CAPE COD (from West to East)				
Town of Falmouth				
1	Nobska Pt. Light House	Federal, historical/cultural resource	14.0	VP 1
2	Nobska Point	Municipal, scenic resource	14.0	VP 1
3,7	Shining Sea Bikeway	Municipal, recreational resource. 3.3-mile long bike path along shore	14.0, 13.0	VP 1, 2.0 miles NE of VP 1
	Town Landing, Falmouth Inner Harbor	Boat Landing	14.0	VP1
4	Trunk River Beach	Municipal, recreational resource	13.5	1.5 miles NE of VP 1
	Quissett Beach	Beach	13.0	1.5 miles NE of VP 1
	Falmouth Beach	Beach	13.0	2.0 miles NE of VP 1
5	Salt Pond/Surf Dr. Frontage	Municipal, conservation resource	13.0	2.0 miles NE of VP 1
6	Salt Pond Acres Wildlife Area	Private nonprofit, conservation resource. 40 acres	13.0	2.0 miles NE of VP 1
8	Welsh Parcel	Municipal, conservation resource	13.0	2.5 miles NE of VP 1
9	Salt Pond Reservation	Private nonprofit, conservation resource	13.0	2.5 miles NE of VP 1
10	Corcoran Parcel	Municipal, recreational resource	13.0	2.5 miles NE of VP 1
11	Surf Drive Beach	Municipal, recreational resource	13.0	2.5 miles NE of VP 1
12	Marina Park	Municipal, recreational resource	12.0	3.0 miles NE of VP 1
	Falmouth Harbor Park	Parkland	12.0	3.0 miles NE of VP 1
13	Deacon's Pond Park	Municipal, recreational resource	12.0	3.0 miles NE of VP 1
14,15	Hotel Park	Municipal, recreational resource, parkland. Two areas of parkland.	12.0	3.0 miles NE of VP 1
	Waterfront Park	Parkland	12.0	3.0 miles NE of VP 1
16	Central Park	Municipal, recreational resource. Parkland.	11.5	3.0 miles NE of VP 1
	Worcester Park	Parkland	11.5	3.0 miles NE of VP 1
17	Falmouth Heights Town Beach	Municipal, recreational resource	11.5	3.5 miles NE of VP 1
	Harbor Entrance Beach	Beach	11.0	3.5 miles NE of VP 1
18	Bristol Beach	Municipal, recreational resource	11.0	4.0 miles NE of VP 1
19	Great Pond Access	Municipal, conservation resource	11.0	4.5 miles NE of VP 1
20	Green Pond Town Landing	Municipal, recreational resource	10.5	5.0 miles NE of VP 1
21	Menauhant Beach	Municipal, recreational resource	10.0	6.0 miles NE of VP1; 7 miles SW of VP 5
22	Menauhant Yacht Club	Private for profit, recreational resource	9.5	6.0 miles NE of VP 1; 7 miles SW of VP 5
23	Washburn Island	State, recreational and conservation resource. Approximately 300 acres.	9.0	6.0 miles SW of VP 5, 6.5 miles NE of VP 1
	Waquoit Bay National Esturine Research Reserve	Area of Critical Environmental Concern (ACEC). 3,000 acres of land and water, incorporates Washburn Island (in Falmouth) and South Cape Beach State Park (in Mashpee)	8.0	5.0 miles SW of VP 5, 7.0 miles NE of VP 1
Town of Mashpee				
	Waquoit Bay National Esturine Research Reserve	Area of Critical Environmental Concern (ACEC). 3,000 acres of land and water, incorporates Washburn Island (in Falmouth) and South Cape Beach State Park (in Mashpee)	8.0	5.0 miles SW of VP 5, 7.0 miles NE of VP 1
24	South Cape Beach State Park	State, recreational and conservation resource. Approximately 400 acres.	7.0	5.0 miles SW of VP 5, 7.0 miles NE of VP 1
	New Seabury Country Club	Ocean Golf Course	6.0	4.0 miles SW of VP 5; 9 miles NE of VP 1
	Beach at New Seabury	Beach	6.0	4.0 miles SW of VP 5; 9 miles NE of VP 1
25	Popponesset Beach	Private for profit, recreational resource	5.5	2.0 miles SW of VP 5, 10 miles NE of VP 1
26	Popponesset Beach	State, conservation resource	5.5	2.0 miles SW of VP 5, 10 miles NE of VP 1
27	Little Thatch Island	Private nonprofit, conservation	5.5	2.0 miles SW of VP 5, 10

Map ID (Refer to Figure 3-38)	Resource Name	Description of Resource	Approximate Distance to WTG (Miles)	Representative Simulation
		resource. Aproximately 2 acres of land.		miles NE of VP 1
28	Popponesset Beach	Private nonprofit, conservation resource.	5.5	2.0 miles SW of VP 5, 10 miles NE of VP 1
Town of Barnstable				
	Town Landing at Oregon Road	Boat Landing	6.0	VP5
	Town Landing at Cross Street	Boat Landing	6.0	VP5
29		Private nonprofit, conservation resource.	6.0	1.5 miles SW of VP 5
30		Private for profit, conservation resource.	6.0	1.0 mile SW of VP 5
	Loop Beach, Cotuit	Beach	6.0	VP 5
31	Sampsons Island	Private nonprofit, conservation resource. 15 acre wildlife sanctuary and barrier beach owned by Massachusetts Audubon Society	6.0	VP 5
	Oyster Harbors Club	Golf Course	6.0	1.0 mile E of VP 5
	Oyster Harbors Beach	Beach	6.0	1.0 mile E of VP 5
32	Rokeby Farms	Private for profit, conservation resource. Approximately 100 acres.	5.5	1.0 mile E of VP 5, 2.0 miles W of VP 6
	Town Landing at Wianno and Sea View Avenues	Boat Landing	6.5	VP 6
	Wianno Beach, Wianno	Beach	6.5	VP 6
	Dowses Beach	Beach	6.5	0.5 miles NE of VP 6
	The Beach Club, Centerville	Private Beach Club	7.0	Between VPs 6 and 7
	Long Beach Conservation Area, Centerville	3.5-acre barrier beach protected by the Barnstable Conservation Commission	7.0	1.0 mile NE of VP 6, 1.5 miles SW of VP 7
33		Municipal, conservation resource	7.0	2.0 miles NE of VP6, 1.0 mile SW of VP 7
	Craigville Beach	Public Beach	7.0	2.0 miles NE of VP6, 1.0 mile SW of VP 7
	Craigville Beach Association	Semi-private Beach	7.0	2.0 miles NE of VP6, 1.0 mile SW of VP 7
34,35		Municipal, conservation resource	7.0	2.0 miles NE of VP6, 0.5 miles W of VP 7
	William H. Covell Memorial Beach	Beach	7.0	2.0 miles NE of VP6, 0.5 miles W of VP 7
36,37	Hyannisport Club	Private for profit, recreational resource. Golf course and club. 35 acres.	6.0	VP 8
	Sea Street (Keyes) Beach	Beach	7.0	1.5 miles E of VP 8
	Kalmus Park Beach	Beach	7.0	1.5 miles E of VP 8
38,39,40		Municipal, conservation resource	7.0	1.5 miles E of VP 8
Town of Yarmouth				
41	Bayview Beach	Municipal, recreational resource.	7.5	2.0 miles NE of VP 8
42	Lewis Bay	Private nonproft, recreational resource	7.0	2.5 miles E of VP 8
43	Colonial Acres Beach	Municipal, recreational resource. Shorefront park	7.5	2.5 miles E of VP 8
	Town Landing off Bay Road	Boat Landing	7.5	2.5 miles E of VP 8
44	Englewood Beach	Municipal, recreational resource	7.0	3.0 miles NE of VP 8
45	Pine Island	Private for profit, conservation resource. 25 acres.	6.5	3.0 miles E of VP 8
46	Point Gammon	Private for profit, conservation resource	5.0	3.0 miles E of VP 8
47,48	Great Island	Private for profit, conservation resource. Approximately 200 acres.	5.5	2.5 miles SE of VP 8
49	Lewis Pond Marsh	Private for profit, conservation resource	7.0	4.0 miles E of VP 8
	Rucknicks Beach	Beach	7.0	4.0 miles E of VP 8
50	Seagull Beach	Municipal, recreational resource	7.0	4.0 miles E of VP 8
51,52	Lewis Pond Marsh	Private for profit, conservation resource. Approximately 100 acres.	7.5	4.0 miles E of VP 8
53	Former Drive-in Theatre	Municipal, recreational resource	8.0	4.5 miles E of VP 8
54	Thatchers Beach	Municipal, recreational resource	7.5	4.5 miles E of VP 8
55	Seaview Beach	Municipal, recreational resource	7.5	4.5 miles E of VP 8

Map ID (Refer to Figure 3-38)	Resource Name	Description of Resource	Approximate Distance to WTG (Miles)	Representative Simulation
56	Parker River Beach	Municipal, recreational resource	7.5	4.5 miles E of VP 8
57	Beachwood Beach	Municipal, recreational resource	8.0	5.0 miles E of VP 8
58	South Middle Beach	Municipal, recreational resource	8.0	5.0 Miles E of VP 8
	Smugglers Beach	Beach	8.0	5.5 miles E of VP 8
59	Bass River Beach and Boat Access	Municipal, conservation resource	8.0	5.5 miles E of VP 8
Town of Dennis				
60	Davis/West Dennis Beach	Municipal, recreational resource. Approximately 150 acres.	9.0	6.0 miles E of VP 8, 12.0 miles NW of VP 26
61	Conserv Land/Loring Ave	Municipal, conservation resource	9.5	7.0 miles E of VP 8, 12.0 miles NW of VP 26
62	Trotting Park Road Lndg.	Municipal, recreational resource	9.5	7.5 miles E of VP 8, 11.5 miles NW of VP 26
63	South Village Road Beach	Municipal, recreational resource	10.0	8.0 miles E of VP 8, 11.0 miles NW of VP 26
64	Bakers Way lndg.	Municipal, recreational resource	10.0	8.0 miles E of VP 8, 11.0 miles NW of VP 26
65	Lower Swan River Marsh	Municipal, conservation resource	10.0	8.0 miles E of VP 8, 11.0 miles NW of VP 26
66	Swan River Marsh	Municipal, conservation resource	10.0	8.0 miles E of VP 8, 11.0 miles NW of VP 26
67	Haigis Beach	Municipal, recreational resource	10.0	8.0 miles E of VP 8, 10.5 miles NW of VP 26
68	Glendon Road Beach	Municipal, recreational resource	10.0	8.5 miles E of VP 8, 10.5 miles NW of VP 26
69	Glendon Road Lndg.	Municipal, recreational resource	10.0	8.5 miles E of VP 8, 10.5 miles NW of VP 26
70	Sea Street Beach	Municipal, conservation resource	10.5	9.0 miles E of VP 8, 10.0 miles NW of VP 26
71	Raycroft Beach	Municipal, recreational resource	11.0	9.5 miles E of VP 8, 10.0 miles NW of VP 26
72	Depot Street Beach	Municipal, recreational resource	11.0	9.5 miles E of VP 8, 10.0 miles NW of VP 26
73	Inman Road Beach	Municipal, recreational resource	11.0	9.5 miles E of VP 8, 10.0 miles NW of VP 26
Town of Harwich				
74	Belmots Road Beach	Municipal, recreational resource	11.5	10.0 miles E of VP 8, 9.5 miles N of VP 26
75	Wixon Pier	Municipal, recreational resource	11.5	10.0 miles E of VP 8, 9.5 miles N of VP 26
76	Pleasant Road Beach	Municipal, recreational and conservation resource	12.0	10.5 miles E of VP 8, 9.0 miles N of VP 26
77	Greys Neck Beach	Municipal, recreational and conservation resource	12.0	11.0 miles E of VP 8, 9.0 miles N of VP 26
78	Englewood Beach	Municipal, recreational and conservation resource	12.5	11.0 miles E of VP 8, 9.0 miles N of VP 26
79	Brooks Road	Private for profit, recreational and conservation resource	12.5	11.0 miles E of VP 8, 9.0 miles N of VP 26
80	Allen Harbor Bulkhead	Municipal, recreational resource	13.0	11.5 miles E of VP 8, 9.0 miles N of VP 26
81	Wah Wah Taysee Beach	Municipal, recreational and conservation resource	13.0	11.5 miles E of VP 8, 9.0 miles N of VP 26
82	Wyndermere Bluffs Beach	Municipal, recreational and conservation resource	13.0	11.5 miles E of VP 8, 9.0 miles N of VP 26
83	Zylpha Road Beach	Municipal, recreational and conservation resource	13.0	12.0 miles E of VP 8, 9.0 miles N of VP 26
84	Atlantic Avenue Beach	Municipal, recreational resource	13.0	12.0 miles E of VP 8, 9.0 miles N of VP 26
85	Sea Street Beach	Municipal, recreational and conservation resource	13.5	12.0 miles E of VP 8, 9.0 miles N of VP 26
86	Bank Street Beach	Municipal, recreational and conservation resource	13.5	12.5 miles E of VP 8, 8.5 miles N of VP 26
87	Merkel Beach	Municipal, recreational and conservation resource	13.5	12.5 miles E of VP 8, 8.5 miles N of VP 26

Map ID (Refer to Figure 3-38)	Resource Name	Description of Resource	Approximate Distance to WTG (Miles)	Representative Simulation
88	Larsen Park	Municipal, recreational resource	14.0	13.0 miles E of VP 8, 8.5 miles N of VP 26
89	Wychmere harbor Dock	Municipal, recreational resource	14.0	13.0 miles E of VP 8, 8.5 miles N of VP 26
90	Saquatucket Harbor Lndg.	Municipal, recreational resource	14.5	13.0 miles E of VP 8, 8.5 miles N of VP 26
91	Neel Road Beach	Municipal, recreational and conservation resource	14.5	13.5 miles E of VP 8, 8.0 miles N of VP 26
92	Walther Road	Municipal, conservation resource	14.5	13.5 miles E of VP 8, 8.0 miles N of VP 26
93	Old Whard Road Lndg.	Municipal, recreational resource	15.0	14.0 miles E of VP 8, 8.0 miles N of VP 26
94,95	Red River Beach	Municipal, recreational resource (parts of beach also fall in to Chatham). Approximately 40 acres.	15.0	14.0 miles E of VP 8, 8.0 miles N of VP 26
96	Red River	Municipal, recreational resource	15.5	14.5 miles E of VP 8, 8.0 miles N of VP 26
Town of Chatham				
97	Red River	Private nonprofit, conservation resource	15.5	14.5 miles E of VP 8, 8.0 miles N of VP 26
98	Forest Beach and Landing	Municipal, recreational resource	15.5	15.0 miles E of VP 8, 8.0 miles N of VP 26
99	Cockle Cove Beach Landing	Municipal, recreational resource	16.5	16.0 miles E of VP 8, 8.0 miles N of VP 26
100	Ridgevale Beach	Municipal, recreational resource. Approximately 20 acres.	17.0	16.0 miles E of VP 8, 8.0 miles N of VP 26
	Harding Beach Landing	Boat Landing	17.0	16.0 miles E of VP 8, 8.0 miles N of VP 26
101	Harding Beach	Municipal, recreational resource. Approximately 210 acres.	17.0	16.5 miles E of VP 8, 7.5 miles N of VP 26
102	Harding Beach Point	Municipal, conservation resource. Approximately 40 acres.	17.5	17.5 miles E of VP 8, 7.0 miles N of VP 26
103	Morris Island Parcel	Private nonprofit, conservation resource	17.5	17.5 miles E of VP 8, 7.0 miles N of VP 26
104	Monomoy Natl Wildlife Refuge	Federal, conservation resource. Approximately 160 acres. Protected by U.S. Fish and Wildlife Service. Only designated wilderness area in southern New England.	17.0	18.0 miles E of VP 8, 5.5 miles N of VP 26
105	Monomoy Natl Wildlife Refuge	Federal, conservation resource. Approximately 1,250 acres. Protected by U.S. Fish and Wildlife Service. Only designated wilderness area in southern New England.	14.5	17.0 miles SE of VP 8, 1.0 mile N of VP 26
106	Monomoy Natl Wildlife Refuge	Federal, conservation resource. Approximately 130 acres. Protected by U.S. Fish and Wildlife Service. Only designated wilderness area in southern New England.	13.0	VP 26
NORTHERN SHORES OF NANTUCKET (from East to West)				
107	Great Pt.	Private nonprofit, conservation resource.	11.0	VP 23
108,109,110	Great Pt.	Private nonprofit, conservation resource.	11.5	VP 23
111	Great Pt.	Private nonprofit, conservation resource.	13.5	2.5 miles SE of VP 23, 6.5 miles NE of VP 22
112	The Haulover	Private nonprofit, conservation resource.	14.5	4.0 miles SE of VP 23, 7.0 miles NE of VP 22
113		Private for profit conservation resource	15.0	4.5 miles SE of VP 23, 7.0 miles NE of VP 22
114	Fisher Land	Private for profit conservation resource	15.5	4.5 miles SE of VP 23, 7.0 miles NE of VP 22
115-123	Coskata-Coatue Wildlife Refuge, Wauwinet	Private nonprofit, conservation resource. Barrier beach on Nantucket	14.0	4.5 - 5.0 miles S of VP 23, 4.0 - 5.0 miles NE of

Map ID (Refer to Figure 3-38)	Resource Name	Description of Resource	Approximate Distance to WTG (Miles)	Representative Simulation
		Sound, Trustees of Reservations property.		VP 22
124	South Pasture	Private nonprofit, conservation resource.	14.0	5.0 miles S of VP 23, 3.0 miles NE of VP 22
125	Coskata-Coatue Wildlife Refuge, Wauwinet	Private nonprofit, conservation resource. Barrier beach on Nantucket Sound, Trustees of Reservations property.	14.0	6.0 miles SE of VP 23, 3.0 miles NE of VP 22
126	Coskata-Coatue Wildlife Refuge, Wauwinet	Private nonprofit, conservation resource. Barrier beach on Nantucket Sound, Trustees of Reservations property.	14.0	6.5 miles SE of VP 23, 2.0 miles E of VP 22
127-132	Coskata-Coatue Wildlife Refuge, Wauwinet	Private nonprofit, conservation resource. Barrier beach on Nantucket Sound, Trustees of Reservations property.	14.0	7.0 miles SE of VP 23, 1.5 miles E of VP 22
	Coatue Point	Private nonprofit, conservation resource. Barrier beach east of the harbor protected by Nantucket Conservation Foundation	14.0	7.0 miles SE of VP 23, 1.5 miles E of VP 22
133, 134, 135	Pocomo Road	Private nonprofit, conservation resource.	15.5	5.5 miles S of VP 23, 5.5 miles NE of VP 22
	Pocomo Beach	Beach	15.5	5.5 miles S of VP 23, 5.5 miles NE of VP 22
136	Medouie Marsh	Private for profit conservation resource. Approximately 100 acres.	15.5	6.0 miles S of VP 23, 5.0 miles E of VP 22
137		Municipal, conservation resource	15.5	6.0 miles S of VP 23, 5.0 miles E of VP 22
138	Quaise Pt. Trust	Private for profit conservation resource	15.5	6.5 miles S of VP 23, 5.0 miles E of VP 22
139	Jay Property	Private for profit conservation resource	16.0	6.5 miles S of VP 23, 5.0 miles E of VP 22
140	Quaise	Private nonprofit, conservation resource.	15.5	6.5 miles S of VP 23, 4.5 miles E of VP 22
141	UMASS Field Station	State, conservation resource. Approximately 100 acres.	15.5	6.5 miles S of VP 23, 4.0 miles E of VP 22
142, 143, 144	Shawkemo	Private for profit conservation resource	15.0	7.0 miles S of VP 23, 3.0 miles E of VP 22
145	Pesthouse Pond	Private nonprofit, conservation resource.	15.0	2.5 miles SE of VP 22
146	Town Dock	Municipal, conservation resource	14.5	1.5 miles SE of VP 22
147	Childrens Hospital	Municipal, recreation resource	14.0	1.0 miles SE of VP 22
148	Brant Pt.	Private nonprofit, conservation resource.	14.0	1.0 miles SE of VP 22
149	Brant Pt.	Private nonprofit, conservation resource.	14.0	1.0 miles SE of VP 22
150	Jetties Beach	Municipal, recreation resource	13.5	0.5 miles E of VP 22
151	CR #74	Private for profit conservation resource	13.5	VP 22
	Cliff Beach	Beach	13.5	VP 22
152	Cliff Rd	Private nonprofit, conservation resource.	13.0	0.5 miles W of VP 22
	Capaum Beach	Beach	13.0	1.0 mile W of VP 22
153	Capaum Road	Private nonprofit, conservation resource. Approximately 30 acres.	13.0	1.0 mile W of VP 22
154	Dionis Beach	Municipal, recreation resource	12.5	2.0 miles W of VP 22
155	Fishers Landing	Public nonprofit, conservation resource	12.0	3.5 miles W of VP 22, 4.5 miles SE of VP 24
156, 157, 158	Eel Point	Private nonprofit, conservation resource. Approximately 120 acres. Protected shorefront and point.	12.0	4.5 miles W of VP 22, 4.0 miles SE of VP 24
159		Municipal, recreation resource	12.5	2.5 miles SE of VP 24
160	Lafarge Trust	Private for profit conservation resource. Approximately 70 acres.	11.5	1.5 miles SE of VP 24
161	CR #73	Private for profit conservation resource	11.0	1.5 miles SE of VP 24

Map ID (Refer to Figure 3-38)	Resource Name	Description of Resource	Approximate Distance to WTG (Miles)	Representative Simulation
162	Hopkins Land	Private for profit conservation resource. Approximately 40 acres.	11.5	1.0 mile SE of VP 24
163	Taylor Land	Private for profit conservation resource. Approximately 40 acres.	11.5	1.0 mile SE of VP 24
164	Lafarge Trust	Private for profit conservation resource. Approximately 50 acres.	11.0	1.0 mile E of VP 24
165	Carlisle Property	Private for profit conservation resource	10.5	1.0 mile E of VP 24
166	Phinney Property	Private for profit conservation resource	10.5	0.5 miles E of VP 24
167	Stevens Property	Private for profit conservation resource	10.5	VP 24
168	North Pond	Private for profit conservation resource	10.5	VP 24
169	North Head Property	Private for profit conservation resource	10.5	VP 24
170	Bigelow Point	Private for profit conservation resource. Approximately 60 acres.	10.5	0.5 miles W of VP 24
171	Salt Box Property	Private for profit conservation resource. Approximately 85 acres.	11.0	0.5 miles S of VP 24
NORTHERN SHORES OF MARTHA'S VINEYARD (from Southeast to Northwest)				
Edgartown				
	Wasque Reservation, Chappaquidick Island	200-acre Trustees of Reservation property with ocean barrier beach and sand barrens.	9.0	5.0 miles S of VP 19
172	South Barrier Beach	State, conservation resource. Approximately 120 acres	9.0	4.0 miles S of VP 19
173		Private nonprofit conservation resource	8.0	3.0 miles S of VP 19
174	Dike Bridge	Municipal, recreation resource	8.0	3.0 miles S of VP 19
175	Cape Poge Reserv/East Beach,Chappaquiddick Island	516-acre Trustees of Reservation property with salt marsh and ocean barrier beach extending to Wasque Reservation	7.0	VP 19 to 5.0 miles S of VP 19
176		Private nonprofit, conservation resource	6.0	0.5 miles S of VP 19
177	Cape Poge Lighthouse	Federal, recreation resource	5.5	VP 19
178	Cape Poge	Private for profit, conservation resource	5.5	VP 19
179	Cape Poge Elbow	Private nonprofit, recreation and conservation resource	5.5	VP 19
180	Cape Poge Elbow	Private nonprofit, recreation and conservation resource	6.0	VP 19
	Chappy Point Beach	Beach	9.0	VP 20
181, 182	Lighthouse Beach	Municipal, recreation and conservation resource	9.0	VP 20
183	Edgartown Pond Lot	Private nonprofit, conservation resource. Approximately 16 acres	9.0	VP 20
	Fuller Street Beach	Beach	9.0	VP 20
	Barrier Beach	Beach	8.5	VP 20
	Little Beach	Beach	8.5	0.5 miles N of VP 20
184	Eel Pond	Private nonprofit, conservation resource	8.5	0.5 miles N of VP 20
185, 186	Eel Pond	Private nonprofit, conservation resource	9.0	0.5 miles N of VP 20
187	Sherrif's Pond	Private nonprofit, conservation resource. Approximately 24 acres	9.0	0.5 miles NW of VP 20
188		Private nonprofit, conservation resource	9.0	1.0 mile NW of VP 20
	Edgartown Beach	Beach	10.0	2.0 miles NW of VP 20
189-232	Joseph Sylvia State Beach	State, recreation and conservation resource. Approximately 50 acres.	10.0	2.0 - 3.0 miles NW of VP 20
Oak Bluffs				
233, 234	Joseph Sylvia State Beach	State, recreation and conservation resource. Approximately 55 acres.	10.0	2.0 miles S of VP 21, 3.5 miles NW of VP 20
	Sarson Island Bird Sanctuary	Protected Island	10.0	2.0 miles S of VP 21, 3.5 miles NW of VP 20
	Felix Neck Wildlife Sanctuary	350-acre Massachusetts Audubon Society Sanctuary	10.0	2.0 miles S of VP 21, 3.5 miles NW of VP 20

Map ID (Refer to Figure 3-38)	Resource Name	Description of Resource	Approximate Distance to WTG (Miles)	Representative Simulation
235, 236	Joseph Sylvia State Beach	State, recreation and conservation resource. Approximately 2 acres.	10.0	1.5 miles S of VP 21, 4.0 miles NW of VP 20
	Farm Neck Golf Course	Golf Course	10.0	1.5 miles S of VP 21, 4.0 miles NW of VP 20
	Oak Bluffs to Edgartown Beach Road	Bike Path	9.5 - 10.0	1.0 - 5.0 miles S of VP 21, 4.5 miles NW - 1.0 miles W of VP 20
237	Hathaven Beach and Harbor	Private for profit, recreation resource	9.5	1.0 mile S of VP 21
238	Farm Pond	Public nonprofit, recreation and conservation resource	9.5	1.0 mile S of VP 21
239	Joseph Sylvia State Beach	State, recreation and conservation resource. Approximately 4 acres.	9.5	0.5 miles S of VP 21
240	Waban Park	Park. Municipal, recreation and conservation resource. Approximately 10 acres.	9.5	VP 21
241	Seaview Beach	Municipal, recreation and conservation resource. Approximately 4 acres.	9.5	VP 21
242	Ocean Park	Park. Municipal, recreation and conservation resource. Approximately 10 acres.	9.5	VP 21
243	Town Beach	Municipal, recreation and conservation resource.	9.5	VP 21
	Oak Bluffs Town Pier	Pier	9.5	VP 21
244	Lake Anthony Walk	Municipal, recreation resource	9.5	VP 21
245	Lakside Park	Municipal, recreation and conservation resource.	9.5	VP 21
246	Harbor Walk	Municipal, recreation resource	9.5	VP 21
247	Washington Park	Park. Municipal, recreation and conservation resource. Approximately 6 acres.	9.5	VP 21
248	Carbarn Lot	Municipal, recreation resource	9.5	VP 21
249	East Chop Beach and YTC	Private nonprofit, recreation resource	9.5	VP 21
250, 251	Arlington Park	Park. Public nonprofit, recreation and conservation resource	9.5	0.5 miles N of VP 21
252	Lincoln Park	Park. Public nonprofit, recreation and conservation resource	9.5	1.0 mile N of VP 21
253	Prospect Park	Park. Municipal, recreation and conservation resource.	9.5	1.0 mile N of VP 21
254	East Chop Cliffs	Private nonprofit, recreation and conservation resource. Approximately 10 acres	9.5	1.0 mile N of VP 21
	East Chop Beach Club	Beach	9.5	1.0 mile N of VP 21
	Morton Park	Park	9.5	1.0 mile N of VP 21
255	Hudson Park	Park. Private nonprofit, recreation and conservation resource.	9.5	1.0 mile N of VP 21
256	Telegraph Lighthouse Land	Municipal, scenic resource	9.5	1.5 miles N of VP 21
	Town Beach near ferry dock	Beach	9.5	2.0 miles W of VP 21
Tisbury				
257	West Chop Trust	Private for profit, recreation and conservation resource. Approximately 6 acres.	11.0	4.0 miles SE of VP 1, 3.0 miles NW of VP 21
258	West Chop Lighthouse	Federal, historical/cultural resource	11.0	4.0 miles SE of VP 1, 3.0 miles NW of VP 21
259	West Chop Trust	Private for profit, recreation and conservation resource	11.5	4.0 miles SE of VP 1, 3.0 miles NW of VP 21

Numbered entries above compiled from MassGIS databases; other entries from web sites listed in References.

Table 5.10-5: Recommended Section 106 Findings of Effect for Aboveground Historic Properties within the Cape Wind Project Visual APE.

Town	Name	Representative Viewpoint	Distance/Direction to Wind Park	Section 106 Effect
Cape Cod				
Falmouth	Nobska Point Light Station	VP 1	14.1 miles ESE	Adverse Effect
Barnstable	Cotuit Historic District	VP 5	6.1 miles SE	Adverse Effect
	Col. Charles Codman Estate	VP 5	6.3 miles SE	Adverse Effect
	Wianno Historic District	VP 6	5.7 miles SSE	Adverse Effect
	Wianno Club	VP 6	5.7 miles SSE	Adverse Effect
	Hyannis Port Historic District	VP 8	6.2 miles S	Adverse Effect
	Kennedy Compound	VP 8	6.2 miles S	Adverse Effect
Chatham	Monomoy Point Lighthouse	VP 26	14.9 miles WSW	Adverse Effect
Martha's Vineyard				
Tisbury	West Chop Light Station	None	11.0 miles ENE	Adverse Effect
Oak Bluffs	East Chop Light	VP 21	9.5 miles ENE	Adverse Effect
	Martha's Vineyard Campground Historic District	None	9.4 miles ENE	No Effect
	Flying Horses Carousel	None	9.4 miles ENE	No Effect
	The Arcade	None	9.4 miles ENE	No Effect
	Dr. Harrison A. Tucker Cottage	VP 21	9.4 miles ENE	Adverse Effect
	Oak Bluffs Christian Union Chapel	None	9.4 miles ENE	No Effect
Edgartown	Edgartown Village Historic District	VP 20	8.8 miles NE	Adverse Effect
	Edgartown Harbor Lighthouse	VP 20	8.8 miles NE	Adverse Effect
	Cape Poge Light	VP 19	5.4 miles NE	Adverse Effect
Nantucket				
Nantucket	Nantucket Historic District: Nantucket Cliffs	VP 22	13.6 miles NNW	Adverse Effect
	Nantucket (Great Point) Light	VP 23	11.2 miles NW	Adverse Effect

Table 5.11-1: Threshold of Human Hearing

Frequency (Hz)	Sound Pressure Level (dB)
16	92
20	84
25	76
31	68
40	60
50	52
63	40
80	34
100	28
125	22
250	13
500	8
1,000	5
2,000	0
4,000	0
8,000	10
16,000	20

Table 5.11-2: Various Indoor and Outdoor Sound Levels

Outdoor Sound Levels	Sound Level (dBA)	Indoor Sound Levels
	110	Rock Band at 5 m
Jet Over-Flight at 300 m	105	
	100	Inside New York Subway Train
Gas Lawn Mower at 1 m	95	
	90	Food Blender at 1 m
Diesel Truck at 15 m	85	
Noisy Urban Area--Daytime	80	Garbage Disposal at 1 m
	75	Shouting at 1 m
Gas Lawn Mower at 30 m	70	Vacuum Cleaner at 3 m
Suburban Commercial Area	65	Normal Speech at 1 m
Quiet Urban Area -- Daytime	60	
	55	Quiet Conversation at 1m
Quiet Urban Area--Nighttime	50	Dishwasher Next Room
	45	
Quiet Suburb--Nighttime	40	Empty Theater or Library
	35	
Quiet Rural Area--Nighttime	30	Quiet Bedroom at Night
	25	Empty Concert Hall
Rustling Leaves	20	Average Whisper
	15	Broadcast and Recording Studios
	10	
	5	Human Breathing
Reference Pressure Level	0	Threshold of Hearing

Table 5.11-3: Existing Sound Levels At Three Representative Coastal Sites (dBA) (November-December, 2002)

	3 meter wind speed (mph)	Point Gammon Yarmouth	Oregon Beach Barnstable	Cape Poge Martha's Vineyard
Average (L_{eq}) Levels				
All Conditions	0-28	35-71	41-61	40-73
Cut-In Wind Speed	5	47-57	46-58	41-63
Design Wind Speed				
On-Shore	16	61-68	54-60	62-71
Off-Shore	16	51-67	48-58	51-69
Background (L_{90}) Levels				
All Conditions	0-28	27-66	34-57	37-70
Cut-In Wind Speed	5	39-54	34-52	39-66
Design Wind Speed				
On-Shore	16	59-65	50-56	59-67
Off-Shore	16	46-58	36-54	45-64

Table 5.11-4: Locations Selected for Modeling Sound Effects of the Project

Modeling Location No.	Description
1	Buoy G5, North channel
2	Buoy R20, Main Channel
3	Bass River Beach, Yarmouth
4	Point Gammon, Yarmouth
5	Lewis Bay, Yarmouth
6	Hyannisport, Barnstable
7	Hyannis Point, Barnstable
8	Wianno Beach, Barnstable
9	Oregon Beach, Barnstable
10	New Seabury, Mashpee
11	Oak Bluffs, Martha's Vineyard
12	Edgartown, Martha's Vineyard
13	Cape Poge, Martha's Vineyard

Table 5.11-5: Maximum Continuous Sound Levels From Project Operation Compared to Baseline Sound Levels (Leq) at Buoys G5 and R20

	Buoy G5	Buoy R20
Cut-In Wind Speed Condition		
Project Operation (dBA)	29.9	34.3
Baseline Level (dBA)	46.4	51.0
Project Audible ?	No	No
Design Wind Speed Condition		
Project Operation (dBA)	39.7	44.7
Baseline Level (dBA)	60.4	65.0
Project Audible ?	No	No

Table 5.11-6: Maximum Continuous Sound Levels From Project Operation Compared to Baseline Sound Levels (Leq) at Lewis Bay Upland Locations For The Cut-In Wind Speed Condition

Modeling Location	Project Operation (dBA)	Baseline Level (dBA)	Project Audible ?
Bass River Beach, Yarmouth	12.2	46.5 – 57.2	No
Point Gammon, Yarmouth	17.8	46.5 – 57.2	No
Lewis Bay, Yarmouth	13.7	45.9 – 58.1	No
Hyannisport, Barnstable	16.0	45.9 – 58.1	No
Hyannis Point, Barnstable	16.5	45.9 – 58.1	No
Wianno Beach, Barnstable	17.0	45.9 – 58.1	No
Oregon Beach, Barnstable	15.8	45.9 – 58.1	No
New Seabury, Mashpee	15.0	45.9 – 58.1	No
Oak Bluffs, Martha'sVineyard	11.9	41.0 – 62.9	No
Edgartown, Martha's Vineyard	11.4	41.0 – 62.9	No
Cape Poge, Martha's Vineyard	16.6	41.0 – 62.9	No

Table 5.11-7: Maximum Continuous Sound Levels From Project Operation Compared to Baseline Sound Levels (Leq) at Lewis Bay Upland Locations for the Design Wind Speed Condition

Modeling Location	Project Operation (dBA)	Baseline Level (dBA)	Project Audible ?
Bass River Beach, Yarmouth	19.8	60.8 – 68.0	No
Point Gammon, Yarmouth	25.9	60.8 – 68.0	No
Lewis Bay, Yarmouth	21.4	53.6 – 59.8	No
Hyannisport, Barnstable	23.9	53.6 – 59.8	No
Hyannis Point, Barnstable	24.5	53.6 – 59.8	No
Wianno Beach, Barnstable	25.1	53.6 – 59.8	No
Oregon Beach, Barnstable	23.7	53.6 – 59.8	No
New Seabury, Mashpee	22.9	53.6 – 59.8	No
Oak Bluffs, Martha'sVineyard	19.7	62.0 – 70.5	No
Edgartown, Martha's Vineyard	19.0	62.0 – 70.5	No
Cape Poge, Martha's Vineyard	24.6	62.0 – 70.5	No

Table 5.11-8: MADEP Noise Policy Compliance Demonstration For All Modeling Locations (dBA)

Location	Lowest Baseline (L_{90})	Project (L_{eq})	Baseline + Project	Increase
Cut-In Wind Speed Condition				
Buoy G5	35	30	36	1
Buoy R20	37	34	39	2
All Other Locations	34-39	11-18	34-39	0 to 0.1
Design Wind Speed Condition				
Buoy G5	49	40	49	0.5
Buoy R20	51	45	52	1
All Other Locations	50-59	19-26	50-59	0

Table 5.11-9: Predicted Above Water Maximum Sound Levels (L_{max}) At Two Seaward Locations Near the Wind Park From Pile Driving for the Wind Park Foundations (dBA)

	Buoy G5	Buoy R20
Receiver Downwind	35 to 76	31 to 66
Receiver Upwind	8 to 49	4 to 39

Table 5.11-10: Predicted Above Water Maximum Sound Levels (L_{max}) At Upland Locations From Pile Driving For The Wind Park Foundations (dBA)

Modeling Location	Winds 0-10 mph	Existing Sound Levels (L_{eq})	Pile Driving Sound (L_{max})
Bass River Beach, Yarmouth	Onshore Offshore	35 to 60 35 to 59	17 to 31 -10 to 4
Point Gammon, Yarmouth	Onshore Offshore	35 to 60 35 to 59	25 to 43 -2 to 16
Lewis Bay, Yarmouth	Onshore Offshore	46 to 59 41 to 58	20 to 34 -7 to 7
Hyannisport, Barnstable	Onshore Offshore	46 to 59 41 to 58	23 to 37 -4 to 10
Hyannis Point, Barnstable	Onshore Offshore	46 to 59 41 to 58	23 to 38 -4 to 11
Wianno Beach, Barnstable	Onshore Offshore	46 to 59 41 to 58	22 to 40 -5 to 13
Oregon Beach, Barnstable	Onshore Offshore	46 to 59 41 to 58	20 to 38 -7 to 11
New Seabury, Mashpee	Onshore Offshore	46 to 59 41 to 58	19 to 36 -8 to 9
Oak Bluffs, Martha's Vineyard	Onshore Offshore	40 to 72 40 to 62	15 to 29 -12 to 2
Edgartown, Martha's Vineyard	Onshore Offshore	40 to 72 40 to 62	16 to 29 -11 to 2
Cape Poge, Martha's Vineyard	Onshore Offshore	40 to 72 40 to 62	22 to 40 -5 to 13

Table 5.11-11: Predicted Underwater Continuous Sound Levels From Project Operation For The Design Wind Condition

Distance From WTG Monopile (meters)	Project Operation (dBL)	Project + Baseline (dBL)	Increase Above Baseline of 107.2 dBL (dBL)
20	104.7	109.1	1.9
50	96.7	107.5	0.3
100	90.7	107.3	0.1
110	89.9	107.2	0.1
120	89.1	107.2	0.0

Table 5.13-1: Peak Magnetic Field Levels Above 115 kV Circuits

Location	168 MW	454 MW
Sea Floor (0 feet)	22 mG	60 mG
	(5 mG@15')[1]	(12 mG @ 15')[1]
+10 feet (3 meters)	4 mG	10 mG
+20 feet (6.1 meters)	2 mG	5 mG
+30 feet (9.1 meters)	1 mG	3 mG

Table 5.13-2: Most Lightly Loaded 33 kV Cable

Location	168 MW	454 MW
Sea Floor (0 feet)	1 mG	3 mG
	(0.3 mG@10')[2]	(0.7 mG@ 10')[2]
+10 feet (3 meters)	0.2 mG	0.4 mG
+20 feet (6.1 meters)	<0.1 mG	0.2 mG
+30 feet (9.1 meters)	<0.1 mG	<0.1 mG

[1] Predicted field level on the sea floor 15 feet (4.6 meters) horizontally from each cable trench.
[2] Predicted field level on the sea floor 10 feet (3 meters) horizontally from the cable trench.

Table 5.13-3: Most Heavily Loaded 33 kV Homerun Cable

Location	168 MW	454 MW
Sea Floor (0 feet)	11 mG	28 mG
	(3 mG @10')	(8 mG@ 10')
+10 feet(3 meters)	2 mG	4 mG
+20 feet (6.1 meters)	0.6 mG	2 mG
+30 feet (9.1 meters)	0.3 mG	1 mG

Table 5.13-4: ESP Peak Magnetic Field Levels Over the 33kV Cables

Location	168 MW	454 MW
2 feet (0.61 meters) (directly over)	189 mG	473 mG
2 feet (0.61 meters) (15 feet (4.6 meters) off centerline)	10 mG	26 mG
10 feet (3 meters) (directly over)	20 mG	51 mG
10 feet (3 meters) (15 feet (4.6 meters) off centerline)	7 mG	18 mG

Table 5.13-5: Range of EMF Exposure Levels

Location	Boaters	Divers and Marine Organisms
Above 115-kV sea cables	**0-5 mG**	**0 – 60 mG**
Above 33-kV inner-array cables	**0-2 mG**	**0 – 28 mG**
Vicinity of ESP	**0 – 51 mG**	**0 – 473 mG**

Table 5.13-6: Maximum Magnetic Flux Density (mG)

Elevation	168 MW	454 MW
Sea Floor (0 feet)	10.80	29.2
MLLW (2 feet (0.61 meters))	6.91	18.8
MHW (5.5 feet (1.7 meters))	4.23	11.5

Table 5.13-7: Maximum Magnetic Flux Density (mG)

Elevation	168 MW	454 MW
3.3 feet (1 meter) above grade	11.3	30.8

Table 5.13-8: Maximum Net Magnetic Fields

Location	Pedestrians/Land Organisms	Divers/Marine Organisms
115-kV onshore cable	0 – 36 mG	not applicable
NSTAR right-of-way	no change	not applicable

Table 5.13-9: Biological Process Strength Compared to EMF Interaction Strength

Interaction process	Interaction strength in living system	Interaction strength for typical "large" EMF levels [*e.g.*, E = 1,000 V/m and M = 100 μT (or 1,000 mG)]
Heating	basal metabolism ~ 100 watts	absorbed 60-Hz EMF energy = ~ 0.000 01 Watts (*i.e.*, 10 μwatts is 10,000,000 fold below basal metabolism)
Photon absorption	chemical bond energies of ~ 0.1 to 5 eV	60 Hz EMF photons = ~0.000001 electron-volt (eV) (*i.e.*, EMF ~ 1 μeV, whereas X-Rays ~ 500 to 5,000 eV)
Force (electrical)	biological forces ~1 to 100 pN	Molecule with electric charge of ±100 = ~ 0.0002 pN (pN = 10^{-12} N = 0.000 000 000 001 Newton)
Force (magnetic)	biological forces ~1 to 100 pN	Twisting force on microscopic ferromagnetic particles, (acting like compass needles), ~2 pN, but EMF force alternates direction every 1/120th s, and averages to zero
Biochemistry	free-radical recombination lifetimes ~ 2 ns	Free-radical chemistry requires larger fields, and any effects occur over nanoseconds (ns) so that 60-Hz field with period of 17 ms appears same as static field

Table 5.13-10: State Transmission Line Standards and Guidelines

State	Electric Field		Magnetic Field	
	On ROW*	Edge ROW	On ROW	Edge ROW
Florida	8 kV/m[a] 10 kV/m[b]	2 kV/m	-	150 mG[a] (max. load) 200 mG[b] (max. load) 250 mG[c] (max. load)
Minnesota	8 kV/m	-	-	-
Montana	7 kV/m	1 kV/m[e]	-	-
New Jersey	-	3 kV/m	-	-
New York	11.8 kV/m 11.0 kV/m[f] 7.0 kV/m[d]	1.6 kV/m	-	200 mG (max. load)
Oregon	9 kV/m	-	-	-

*ROW = right-of-way (or in the Florida standard, certain additional areas adjoining the right-of-way).
kV/m = kilovolt per meter. One kilovolt = 1,000 volts.
[a] For lines of 69-230 kV.
[b] For 500 kV lines.
[c] For 500 kV lines on certain existing R.O.W.
[d] Maximum for highway crossings.
[e] May be waived by the landowner.
[f] Maximum for private road crossings.

Source - EMF Electric and Magnetic Fields Associated with the Use of Electric Power, Questions & Answers, June 2002, National Institute of Environmental Health Sciences, National Institutes of Health

Table 5.16-1: Estimated Annual Health Impacts for Actual Emissions from the Salem Harbor and Brayton Point Power Plants from the Harvard Study (Levy et al., 2000)1

	Salem Harbor	Brayton Point
Net Electrical Generation (MWh)	3,900,083 (1998)	8,936,579 (1998)
Estimated Annual Health Impacts		
Premature Deaths [2]	30	80
Chronic Bronchitis	57	115
Respiratory Hospital Admission	27	55
Cardiovascular Hospital Admission	16	32
Emergency Room Visits	570	1140
Asthma Attacks	14,400	28,900
Restricted Activity Day	16,700	33,500
Minor Restricted Activity Day	28,100	56,000
Respiratory Symptom Day	99,000	199,000

[1] Data in the above table were obtained from:
Levy, J. I., J.D. Spengler, D. Hlinka, and D. Sullivan. 2000. Estimated Public Health Impacts of Criteria Pollutant Air Emissions from the Salem Harbor and Brayton Point Power Plants. Harvard School of Public Health and Sullivan Environmental Consulting, Inc. May 2000.
[2] The estimated number of premature deaths is based on revised data from Levy and Spengler (2002) and EPA's revised value of statistical life:
Levy, J. I. and J.D. Spengler. 2002. Modeling the Benefits of Power Plant Emission Controls in Massachusetts. *J. Air Waste Manage. Assoc.* 52:5-18.
New York Times. 2003. EPA Drops Age-Based Cost Studies. Published May 8, 2003.

Table 5.16-2: Housing Occupancy in Barnstable and Yarmouth

Housing Parameter	Number	Percent
Total Housing Units	41,623	100.0%
Occupied Housing Units	31,146	74.8%
Vacant housing units	10,477	25.2%

Source: Department of Housing and Community Development; U.S. Census Bureau, Census 2000.

Table 5.16-3 - Calculation of Wind Park Offset Ratios

Power Plant	Annual Net Generation (MWh)[1,2]	Offset Ratio by Wind Park[3]
Proposed Wind Park	1,489,200	1.0000
Salem Harbor[4]	3,900,083	0.3818
Brayton Point[4]	8,936,579	0.1666
Canal Plant[5]	6,107,691	0.2438

[1] Wind Park Net Generation based on 170 MW yearly average power production x 8,760 hours/year
[2] Power Plant Net Generation based on 1998 net generation
[3] Offset ratio calculated according to the following formula:
Net Wind Park Generation (MWh) / Net Plant Generation (MWh)
[4] Levy, J. I., J.D. Spengler, D. Hlinka, and D. Sullivan. 2000. Estimated Public Health Impacts of Criteria Pollutant Air Emissions from the Salem Harbor and Brayton Point Power Plants. Harvard School of Public Health and Sullivan Environmental Consulting, Inc. May 2000.
[5] Emission Control Plan, MIRANT, 12/27/01, p. 2-2

Table 5.16-4 - Pollutant Emission Reductions using Wind Park Average Contribution (Tons/Year)

Reference	CO2	SO2	NOx	PM	CO	VOC
ISO New England Marginal Emission Rates [1]	1,108,039	4,606	1,415	N/A	N/A	N/A
Salem Harbor [2, 3]	N/A	9,800	2,600	110	N/A	N/A
Brayton Point [2,3]	N/A	11,200	2,460	68	N/A	N/A
Canal Plant [2,4]	1,426,886	8,098	2,152	353	1,396 [5]	44 [5]
Average of Salem, Brayton, Canal	1,426,886	9,699	2,404	177	1,396	44
Number used in Analysis	**1,108,039**	**4,606**	**1,415**	**177**	**1,396**	**44**

N/A = Not available
[1] The 2000 ISO New England Marginal Emission Rates in lbs/MWh for CO2 = 1488.1; SO2 = 6.2; and NOx = 1.9
Pollutant emission reductions using net wind park generation and ISO New England marginal emission rates are calculated as follows: ISO New England Avg Annual Marginal Emission Rate in lbs/MWh x 1,489,200 MW (net annual production expected from wind park) / 2000 (to convert to tons) = Pollutant Emission Reduction (tons/yr) from Wind Park
Using example with CO2: 1,488.10 lbs/MWh x 1,489,200 MW / 2000 = 1,108,039 Tons/Year
[2] Pollutant Emission Reductions are obtained by multiplying the plant's yearly emissions by the Wind Park offset ratio from Table 5.16-2 as follows:
Salem: Yearly emissions for each pollutant x 0.381
Brayton: Yearly emissions for each pollutant x 0.167
Canal: Yearly emissions for each pollutant x 0.243
[3] Yearly Emission Data based on 1998 data obtained from Dr. Bruce Egan (Peer Reviewer), Harvard Study
[4] Yearly Emission Data based on Emission Control Plan, MIRANT, 12/27/01, p. 2-2
[5] Yearly Emission Data based on Southern Energy Graph reproduced in Sandwich Enterprise, 10/1/99

Table 5.16-5: Calculated Yearly Emission Reductions from the Cape Wind Project

Pollutant	Health / Environmental Impact of Pollutant	Estimated Reduction (tons/year)
SO_2	causes/aggravates respiratory illness and aggravates existing heart and lung disease	4,606 [1]
NO_x	causes/aggravates respiratory illness	1,415 [1]
PM	causes/aggravates respiratory problems	177 [2]
CO	reduces oxygen delivery to the body's organs and tissues	1,396 [3]
VOC	causes/aggravates respiratory problems, thought to be linked to cancer	44 [3]
CO_2	primary emission responsible for global warming and climate change. Health impacts associated with global climate change include the rapid spread of disease and increased heart and lung problems. (USEPA, 2000)	1,108,039 [1]

[1] Based on ISO New England marginal emission rates
[2] Based on average yearly emission rates from Salem, Brayton, and Canal Power Plants
[3] Based on yearly emission rates from Canal (no yearly emission data available for Salem or Brayton)

Table 5.16-6 - Estimated Health Effect Offsets from Proposed Wind Park Extrapolated from Levy et al. (2000) and Levy and Spengler (2002) (Events per Year)

Estimated Health Impacts	Salem Harbor (only)	Brayton Point (only)	Average Offset Saving (numbers rounded down)	Monetary value (per unit)	Average Monetary Savings
Offset Power Ratio by Wind Park	**0.381**	**0.167**			
Premature Deaths *	30 x 0.381 = **11**	80 x 0.167 = **13**	12	$3,700,000	$44,400,000
Chronic Bronchitis	57 x 0.381 = **22**	115 x 0.167 = **19**	20	$260,000	$5,200,000
Respiratory Hospital Admission	27 x 0.381 = **10**	55 x 0.167 = **9**	9	$25,000	$225,000
Cardiovascular Hospital Admission	16 x 0.381 = **6**	32 x 0.167 =**5**	5	$24,000	$120,000
Emergency Room Visits	570 x 0.381 = **217**	1,140 x 0.167 = **190**	203	$1,000	$203,000
Asthma Attacks	14,400 x 0.381 = **5,486**	28,900 x 0.167 = **4,826**	5,156	$61	$314,516
Restricted Activity Day	16,700 x 0.381 = **6,363**	33,500 x 0.167 = **5,595**	5,978	$220	$1,315,160
Minor Restricted Activity Day	28,100 x 0.381 = **10,706**	56,000 x 0.167 = **9,352**	10,029	$70	$702,030
Respiratory Symptom Day	99,000 x 0.381 = **37,719**	199,000 x 0.167 = **33,233**	35,476	$18	$638,568
TOTAL ANNUAL AVERAGE MONETARY SAVINGS FROM PROPOSED WIND PARK					**$53,118,274**

* Both the Levy (2000) and Levy and Spengler (2002) studies utilized the EPA value of statistical life that was in effect at the time of those studies to calculate the monetary value of a premature death. The EPA recently decreased their valuation of human life from 6.1 million to 3.7 million (New York Times, 2003). The revised 3.7 million value is used in this calculation.