

<b>Table 5.2.3-1</b>					
<b>Vessels Used for Cape Wind Project</b>					
Activity Type	Vessel Type	Count	Duration	Operating Hours (per unit)	Assumptions
<b>Construction Activity Inside 25 Miles</b>					
<b>Pile Installation</b>					
Move jack up barge to wind park	Attendant tug	4 trips	4hrs/trip	16	Done twice (once per year)
Transport piles and transition pieces to wind park	Tow tug	86 trips	4hrs/trip	344	Avg. 3 piles per trip, 130 piles, duration only within 25 miles
Pile barge handling tug at wind park	Attendant tug	130 days	4hrs/day	520	3 piles per week, attendant tugs only operate equivalent of ½ day
Put piles in place	Primary 500 ton crane	130 days	4hrs/day	520	
Pile driving	Hydraulic ram	130 piles	4hrs/pile	520	IHC S-1200 hydrohammer
Moving crew in and out	Crew boats	130 days	2hrs/day	260	
Transition piece handling tugs at wind park	Attendant tug	130 days	4hrs/day	520	3 pieces per week, attendant tugs only operate equivalent of ½ day
Set transition pieces	Primary 500 ton crane	130 days	4hrs/day	520	
<b>Installation of Scour Protection</b>					
Move scour protection installation equipment to wind park	Attendant tug	4 trips	4hrs/trip	16	Done twice (once per year)
Transport rock armor barges	Tow tug	276 trips	4hrs/trip	1,104	Speed of 8 knots
Transport filler material barges	Tow tug	370 trips	4hrs/trip	1,480	Speed of 8 knots
Install rock armor	Crane	65 days	8hrs/day	520	2 towers per day
Install filler material	Crane	65 days	8hrs/day	520	2 towers per day
Armor/filler barge handling tugs at wind park	Attendant tugs	130 days	4hrs/day	520	
<b>Cable Laying</b>					
115 kV cable laying barge to wind farm	Tow tug	4 trips	4hrs/trip	16	
Put cable in place	Crane barge	15 days	10hrs/day	150	10 hrs/day for 15 work days
Put cable in place	Attendant tug	15 days	10hrs/day	150	10 hrs/day for 15 work days
Put cable in place	Attendant tug	15 days	10hrs/day	150	10 hrs/day for 15 work days
Moving crew in and out	Crew boats	15 days	2hrs/day	30	

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33 kV cable laying barge to wind farm	Tow tug	26 trips	4hrs/trip	104	13 round trips
Put cable in place	Crane barge	130 days	10hrs/day	1,300	10 hrs/day for 10 work days/string – 13 strings
Put cable in place	Attendant tug	130 days	10hrs/day	1,300	10 hrs/day for 10 work days/string – 13 strings
Move crane barge to cofferdam location	Tow tug	4 trips	3hrs/trip	12	
HDD cofferdam excavation	Crane barge	2 days	10hrs/day	20	2 days at 10 hrs/day; speed at approx. 12 knots
Sheet pile driving for cofferdam		2 days	10hrs/day	20	2 days at 10 hrs/day
Compressor drive		2 days	8hrs/day	16	2 days at 8 hrs/day
Sheet pile removal		2 days	10hrs/day	20	5 days at 10 hrs/day
Cofferdam backfill	Crane barge	2 days	10hrs/day	20	2 days at 10 hrs/day
Moving crew in and out	Crew boat	10 days	2hrs/day	20	1 hr each way per crew boat
<b>Turbine Installation</b>					
Turbines to wind farm	One specialized vessel	86 trips	4hrs/trip	344	Only emissions within 25 miles of wind park
Stabilizing the WTG vessel in correct location and elevation	Jacking system with 6 legs	130 days	2hrs/day	260	
Tower installation	Primary 500 ton crane	130 days	2hrs/day	260	
Nacelle installation	Primary 500 ton crane	130 days	2hrs/day	260	
Rotor installation	Primary 500 ton crane	130 days	2hrs/day	260	
Moving crew in and out	Crew boats	130 days	2hrs/day	260	2 days per WTG
<b>ESP Installation</b>					
Crane barge towing	Tow tug	2 trips	12hrs/trip	24	12 hours out, 12 hours back
Setting template for ESP installation	Crane	1	16hrs	16	
Handling crane barge	Attendant tug	1	16hrs	20	4 hours transit and 16 hours on site
Pile installation barge towing	Tow tug	2 trips	9hrs/trip	18	12 hours out, 6 hours back
Pile setting	Crane	6	3hrs	18	
Handling barge	Attendant crane	6	3hrs	18	

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<b>Activity Type</b>	<b>Vessel Type</b>	<b>Count</b>	<b>Duration</b>	<b>Operating Hours (per unit)</b>	<b>Assumptions</b>
Pile driving	Hydraulic ram	6	2hrs	12	IHC S-500 hydrohammer
ESP deck to wind farm	Tow tug	2 trips	9hrs/trip	18	12 hours out, 6 hours back
Crane barge towing	Tow tug	2 trips	12hrs/trip	24	12 hours out, 12 hours back
Setting the deck for ESP installation	Crane barge	1	16hrs	16	
Handling crane barge	Attendant tug	2 trips	9hrs/trip	18	12 hours out, 6 hours back
Moving crew in and out	Crew boats	160 trips	2hrs/trip	320	40 days, 2 round trips per day, 2 hours each way
<b>Construction Activity Outside 25 Miles</b>					
<b>Transport</b>					
Move jack up barge	Attendant tug	4 trips	12	50	
Transport piles and transition pieces	Tow tug	86 trips	12	1,075	Avg. 3 piles per trip, 130 piles
Move scour installation equipment	Attendant tug	4 trips	12	50	This is done twice (once per year)
Transport rock armor barges	Tow tug	276 trips	12	3,449	Speed of 8 knots
Transport filler material barges	Tow tug	370 trips	12	4,624	Speed of 8 knots
<b>Cable Laying</b>					
115 kV cable laying barge	Tow tug	4 trips	12	50	
33 kV cable laying barge	Tow tug	26 trips	12	325	13 round trips
Move crane barge to cofferdam location	Tow tug	4 trips	12	50	
<b>Turbine Installation</b>					
Turbines	One specialized vessel	86 trips	12	1,075	
<b>ESP Installation</b>					
Crane barge towing	Tow tug	2 trips	37	75	12 hours out, 12 hours back (prorated for traveling beyond 25-mile)
Pile installation barge towing	Tow tug	2 trips	28	56	12 hours out, 6 hours back (prorated for traveling beyond 25-mile)

<b>Table 5.2.3-1</b>					
<b>Vessels Used for Cape Wind Project</b>					
Activity Type	Vessel Type	Count	Duration	Operating Hours (per unit)	Assumptions
ESP deck to wind farm	Tow tug	2 trips	28	56	12 hours out, 6 hours back (prorated for traveling beyond 25-mile)
Crane barge towing	Tow tug	2 trips	37	75	12 hours out, 12 hours back (prorated for traveling beyond 25-mile)
<b>Decommissioning Inside 25 Miles</b>					
<b>Pile Removal</b>					
Moving crew in and out	Crew boats	130 days	2hrs/day	260	
Transport transition pieces from wind farm	Tow tug	33 trips	4hrs/trip	132	4 transition pieces per trip
Transition piece handling tug at wind park	Attendant tug	130 days	4hrs/day	520	3 pieces per week, attendant tugs only operate equivalent of 1/2 day
Remove transition pieces	Primary 500 ton crane	130 days	4hrs/day	520	2 days/WTG
<b>Scour Protection Removal</b>					
Move scour protection removal equipment to wind park	Attendant tug	4 trips	4hrs/trip	16	This is done twice
Transport rock armor barges	Tow tug	276 trips	4hrs/trip	1,104	Speed of 8 knots
Transport filler material barges	Tow tug	370 trips	4hrs/trip	1,480	Speed of 8 knots
Remove rock armor	Crane	65 days	8hrs/day	520	2 towers per day
Remove filler material	Crane	65 days	8hrs/day	520	2 towers per day
Armor/filler barge handling tugs at wind park	Attendant tugs	130 days	4hrs/day	520	
<b>Cable Removal</b>					
115 kV cable removal barge to wind farm	Tow tug	4 trips	4hrs/trip	16	
33 kV cable removal barge	Tow tug	26 trips	4hrs/trip	104	13 round trips
Remove cable	Crane barge	15 days	10hrs/day	150	10 hrs/day for 15 work days
Remove cable	Attendant tug	15 days	10hrs/day	150	10 hrs/day for 15 work days
Remove cable	Anchoring tug	15 days	10hrs/day	150	10 hrs/day for 15 work days
Moving crew in and out	Crew boats	15 days	2hrs/day	30	

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Vessels Used for Cape Wind Project						
Activity Type	Vessel Type	Count	Duration	Operating Hours (per unit)	Assumptions	
Remove cable	Crane barge	130 days	10 hrs/day	1,300	10 hrs/day for 10 work days/string – 13 strings	
Remove cable	Attendant tug	130 days	10hrs/day	1,300	10 hrs/day for 10 work days/string – 13 strings	
Move crane barge to cofferdam location	One tug	4 trips	4hrs/trip	16		
HDD cofferdam excavation	Crane barge	2 days	10hrs/day	20	2 days at 10 hrs/day; speed of 12 knots	
Sheet pile driving for cofferdam		2 days	10hrs/day	20	2 days at 10 hrs/day	
Compressor drive		2 days	8hrs/day	16	2 days at 8 hrs/day	
Sheet pile removal		2 days	10hrs/day	20	2 days at 10 hrs/day	
Cofferdam backfill	Crane barge	2 days	10hrs/day	20	2 days at 10 hrs/day	
Moving crew in and out	Crew boat	10 days	2hrs/day	20	1 hour each way per crew boat	
<b>Turbine Decommissioning</b>						
Turbines from wind farm	One specialized vessel	86 trips	4hrs/trip	344	Only emissions within 25 miles of wind park	
Stabilizing the WTG vessel in correct location and elevation	Jacking system with 6 legs	130 days	2hrs/day	260		
Tower decommission	Primary 500 ton crane	130 days	2hrs/day	260		
Nacelle decommission	Primary 500 ton crane	130 days	2hrs/day	260		
Rotor decommission	Primary 500 ton crane	130 days	2hrs/day	260		
Moving crew in and out	Crew boats	130 days	2hrs/day	260	2 days per WTG	
<b>ESP Decommissioning</b>						
Crane barge towing	Tow tug	2 trips	12hrs/trip	24	12 hours out, 12 hours back	
Setting template for ESP decommission	Crane	1	16hrs	16		
Handling crane barge	Attendant tug	1	16hrs	20	4 hours transit and 16 hours on site	
Pile barge	Tow tug	2 trips	9hrs/trip	18	12 hours out, 6 hours back	
ESP deck from wind farm	Tow tug	2 trips	9hrs/trip	18	12 hours out, 6 hours back	
Crane barge towing	Tow tug	2 trips	12hrs/trip	24	12 hours out, 12 hours back	
Setting the deck for ESP decommission	Crane barge	1	16hrs	16		
Handling the crane barge	Attendant tug	1	18hrs	18		

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Moving crew in and out	Crew boats	160 trips	2hrs/trip	320	40 days, 2 round trips per day, 2 hours each way
<b>Meteorological Tower Decommissioning</b>					
Crane barge towing	Tow tug	2 trips	12hrs/trip	24	12 hours out, 12 hours back
Handling crane barge	Attendant tug	6 days	8hrs/day	48	
Removing mast	Crane barge	2 days	8hrs/day	16	
Removing deck	Crane barge	2 days	8hrs/day	16	
Removing pilings	Crane barge	2 days	8hrs/day	16	
Moving crew in and out	Crew boats	6 days	2hrs/day	12	
<b>Decommissioning Outside 25 Miles</b>					
<b>Pile Removal</b>					
Transport transition pieces from wind farm	Tow tug	33 trips	11	352	4 transition pieces per trip
<b>Scour Protection Removal</b>					
Move scour protection removal equipment to wind park	Attendant tug	4 trips	11	43	This is done twice
Transport rock armor barges	Tow tug	276 trips	11	2,945	Speed of 8 knots
Transport filler material barges	Tow tug	370	11	3,948	Speed of 8 knots
Cable Removal 115 kV cable removal barge	Tow tug	4 trips	11	43	
33 kV cable removal barge	Tow tug	26 trips	11	277	13 round trips
Move crane barge to cofferdam location	Tow tug	4 trips	11	43	
<b>Turbine Decommissioning</b>					
Turbines from wind farm	One specialized vessel	86 trips	11	918	
<b>ESP Decommissioning</b>					
Crane barge towing	Tow tug	2 trips	32	64	12 hours out, 12 hours back (prorated for traveling beyond 25-mile)
Pile barge towing	Tow tug	2 trips	24	48	12 hours out, 6 hours back (prorated for traveling beyond 25-mile)

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<b>Activity Type</b>	<b>Vessel Type</b>	<b>Count</b>	<b>Duration</b>	<b>Operating Hours (per unit)</b>	<b>Assumptions</b>
ESP deck from wind farm	Tow tug	2 trips	24	48	12 hours out, 6 hours back (prorated for traveling beyond 25-mile)
Crane barge towing	Tow tug	2 trips	32	64	12 hours out, 12 hours back (prorated for traveling beyond 25-mile)
<b>Meteorological Tower Decommissioning</b>					
Crane barge towing	Tow tug	2 trips	32	64	12 hours out, 12 hours back (prorated for traveling beyond 25-mile)