

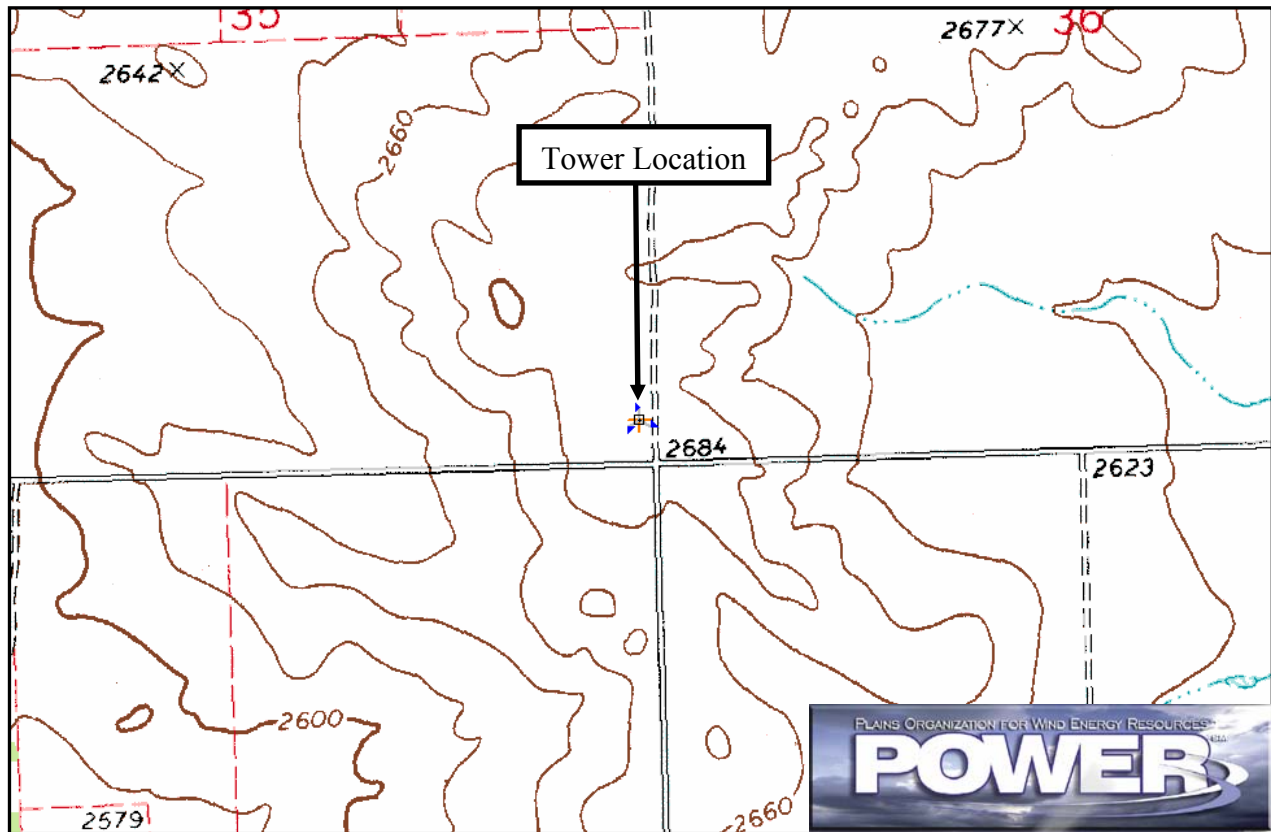
# Wind Resource Summary for Green River Site

## North Dakota Utility Study Springs<sup>a</sup> 1995, 1996 & 1997

### Site Description:

Latitude: N 47° 4' 5"	Township: 142 N
Longitude: W 102° 55' 38"	Range: 97 W
Elevation: 2684 feet	Section: 18
Tower Type: Lattice Tower	Tower Height: 271 feet

The monitoring site was 14.3 miles north-northeast of the town of South Heart, North Dakota. An existing tower was used and instrumented at four levels: 33 ft (10 m), 82 ft (25 m), 131 ft (40 m), and 180 ft (55 m). The tower is located on a top of a small hill with good exposure to the wind in all directions. Cultivated fields characterize the area's landscape.



Summary Wind Data:	33 ft AGL <sup>b</sup>	82 ft AGL	131 ft AGL	180 ft AGL
Mean Wind Speed	12.8 mph	14.7 mph	16.0 mph	16.6 mph
Maximum, 60-min Mean Wind Speed	51.2 mph at 180 ft AGL – 4/5/1997 8:00 p.m.			
Estimated Wind Power Class <sup>c</sup>	Class 3 (391 W/m <sup>2</sup> at 180 ft AGL)			

<sup>a</sup> Spring is defined as the months of March, April, and May. Spring 1995 begins with March 1995. Data recovery rates at 33, 82, 131 and 180 feet were 73%, 73%, 73% and 73%, respectively.

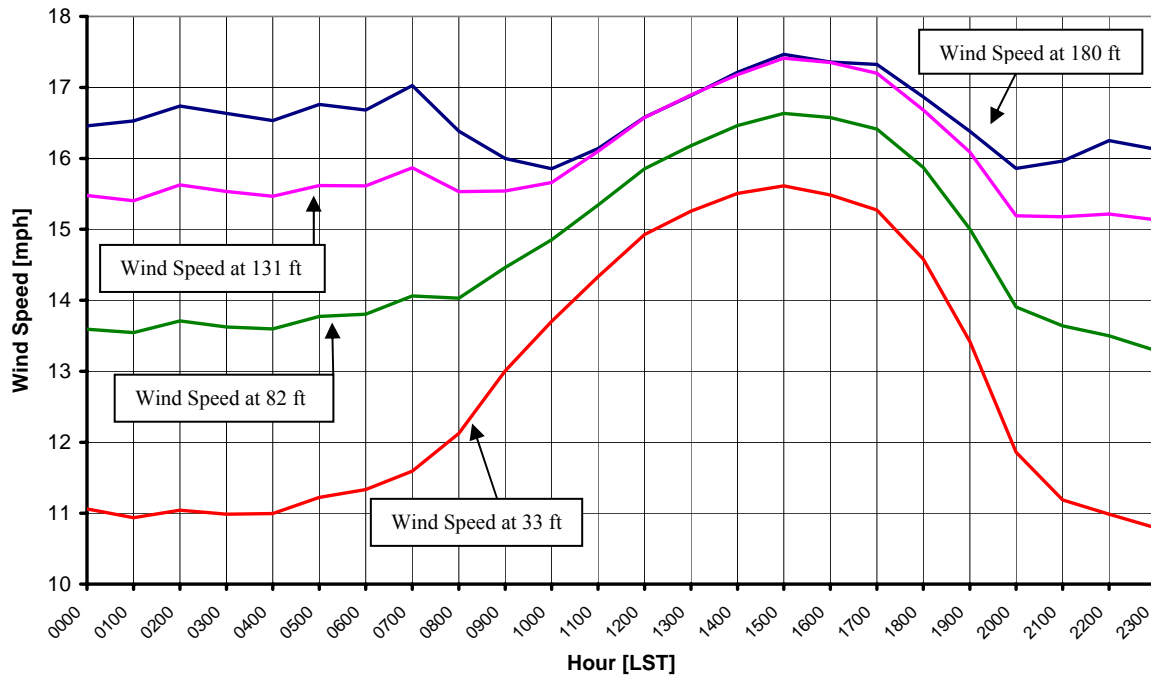
<sup>b</sup> Above ground level.

<sup>c</sup> Air temperature was not factored into calculations.

## Average Hourly Wind Speeds

LST <sup>d</sup>	180 ft AGL		131 ft AGL		82 ft AGL		33 ft AGL	
	mph	m/s	mph	m/s	mph	m/s	mph	m/s
0000	16.5	7.36	15.5	6.92	13.6	6.08	11.1	4.94
0100	16.5	7.39	15.4	6.89	13.5	6.05	10.9	4.89
0200	16.7	7.48	15.6	6.98	13.7	6.13	11.0	4.94
0300	16.6	7.44	15.5	6.94	13.6	6.09	11.0	4.91
0400	16.5	7.39	15.5	6.91	13.6	6.08	11.0	4.92
0500	16.8	7.49	15.6	6.98	13.8	6.16	11.2	5.02
0600	16.7	7.46	15.6	6.98	13.8	6.17	11.3	5.07
0700	17.0	7.61	15.9	7.09	14.1	6.29	11.6	5.18
0800	16.4	7.32	15.5	6.94	14.0	6.27	12.1	5.42
0900	16.0	7.15	15.5	6.95	14.5	6.47	13.0	5.81
1000	15.9	7.09	15.7	7.00	14.9	6.64	13.7	6.13
1100	16.1	7.21	16.1	7.20	15.3	6.86	14.3	6.41
1200	16.6	7.41	16.6	7.41	15.9	7.09	14.9	6.67
1300	16.9	7.55	16.9	7.55	16.2	7.23	15.3	6.82
1400	17.2	7.69	17.2	7.68	16.5	7.36	15.5	6.93
1500	17.5	7.81	17.4	7.78	16.6	7.44	15.6	6.98
1600	17.4	7.76	17.4	7.76	16.6	7.41	15.5	6.92
1700	17.3	7.74	17.2	7.69	16.4	7.34	15.3	6.83
1800	16.9	7.54	16.7	7.46	15.9	7.10	14.6	6.52
1900	16.4	7.32	16.1	7.19	15.0	6.71	13.4	6.00
2000	15.9	7.09	15.2	6.79	13.9	6.22	11.9	5.30
2100	16.0	7.14	15.2	6.78	13.6	6.10	11.2	5.00
2200	16.3	7.26	15.2	6.80	13.5	6.03	11.0	4.91
2300	16.1	7.21	15.1	6.77	13.3	5.94	10.8	4.83

**North Dakota Utility Study – Green River Site  
Springs 1995, 1996 & 1997**



<sup>d</sup> Local standard time.



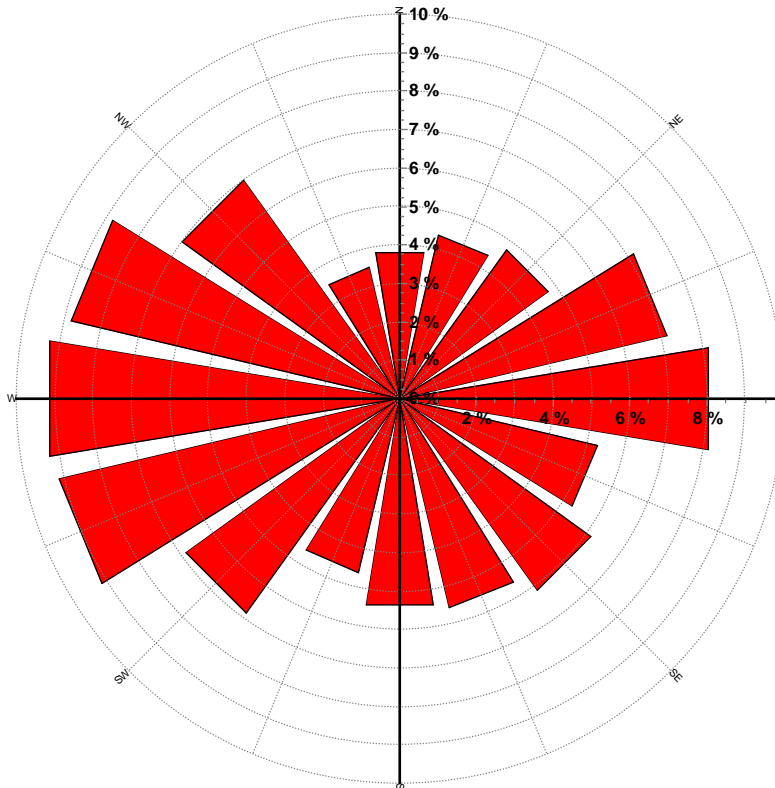
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Creation Date: 4/1/2005

## Wind Directional Frequency

<u>Winds from the...</u>	<u>Frequency (%)</u>
NNW	3.5
NW	7.0
WNW	8.8
W	9.3
WSW	9.1
SW	6.9
SSW	4.6
S	5.5
SSE	5.6
SE	6.2
ESE	5.3
E	8.2
ENE	7.2
NE	4.7
NNE	4.4
N	3.8

North Dakota Utility Study – Green River Site  
Wind Rose for 180 ft AGL  
Springs 1995, 1996 & 1997

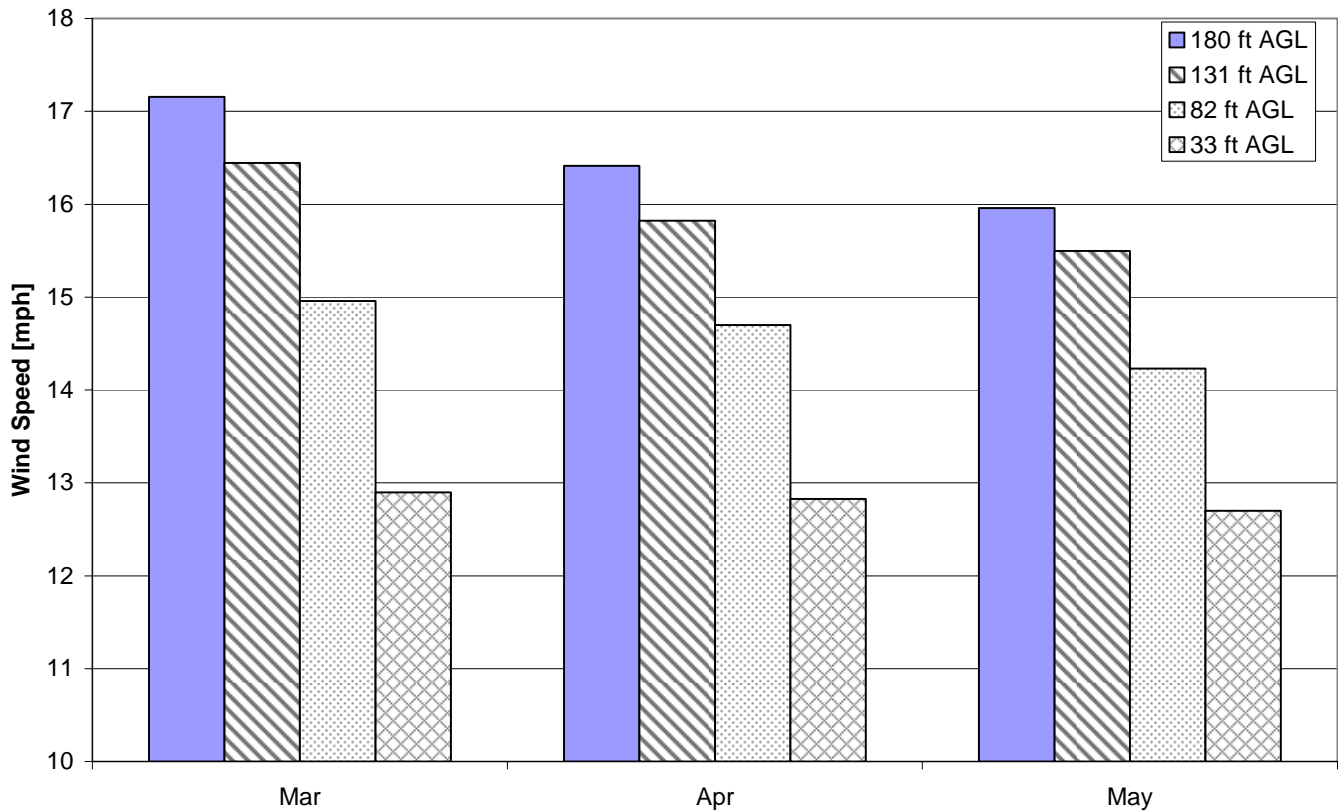


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## Monthly Wind Speed Averages

Month	180 ft AGL		131 ft AGL		82 ft AGL		33 ft AGL	
	mph	m/s	mph	m/s	mph	m/s	mph	m/s
Mar	17.2	7.67	16.4	7.35	15.0	6.69	12.9	5.77
Apr	16.4	7.34	15.8	7.07	14.7	6.57	12.8	5.73
May	16.0	7.13	15.5	6.93	14.2	6.36	12.7	5.68

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