

Wind Resource Summary for Luverne Site

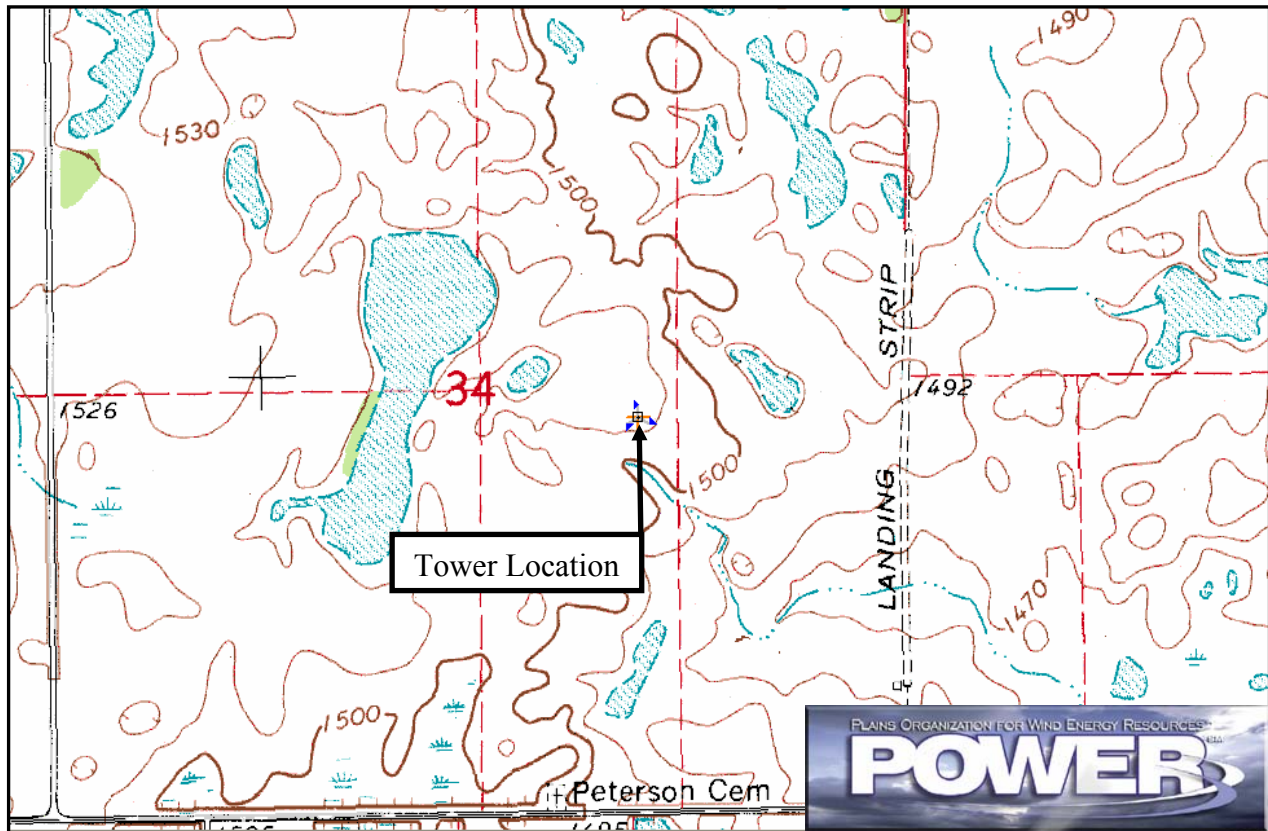
Griggs/Steele Wind Development Group LLC

Monitoring Period:^a 7/1/2000 – 6/30/2005

Site Description:

Latitude: N 47° 19' 57"	Township: 145 N
Longitude: W 97° 54' 27"	Range: 57 W
Elevation: 1510 feet	Section: 34
Tower Type: NRG Tilt-up	Tower Height: 131 feet

The monitoring site is 5.7 miles north-northeast of the town of Luverne, North Dakota. The tower is instrumented at three levels: 33 ft (10 m), 98 ft (30 m), and 131 ft (40 m). The site is 3.2 miles east of the Sheyenne River on the Pembina Escarpment. The land around the site is primarily cultivated fields with many small ponds and lakes in the area.



Summary Wind Data:	33 ft AGL ^b	98 ft AGL	131 ft AGL
Mean Wind Speed	13.0 mph	15.7 mph	17.5 mph
Maximum, 60-min Mean Wind Speed	52.3 mph at 131 ft AGL – 2/11/2002 3:00 p.m.		
Estimated Wind Power Class ^c	Class 4 (440 W/m ² at 131 ft AGL)		

^a Data recovery rates for wind speed at 33, 98, and 131 feet were 83%, 81%, and 56%, respectively.

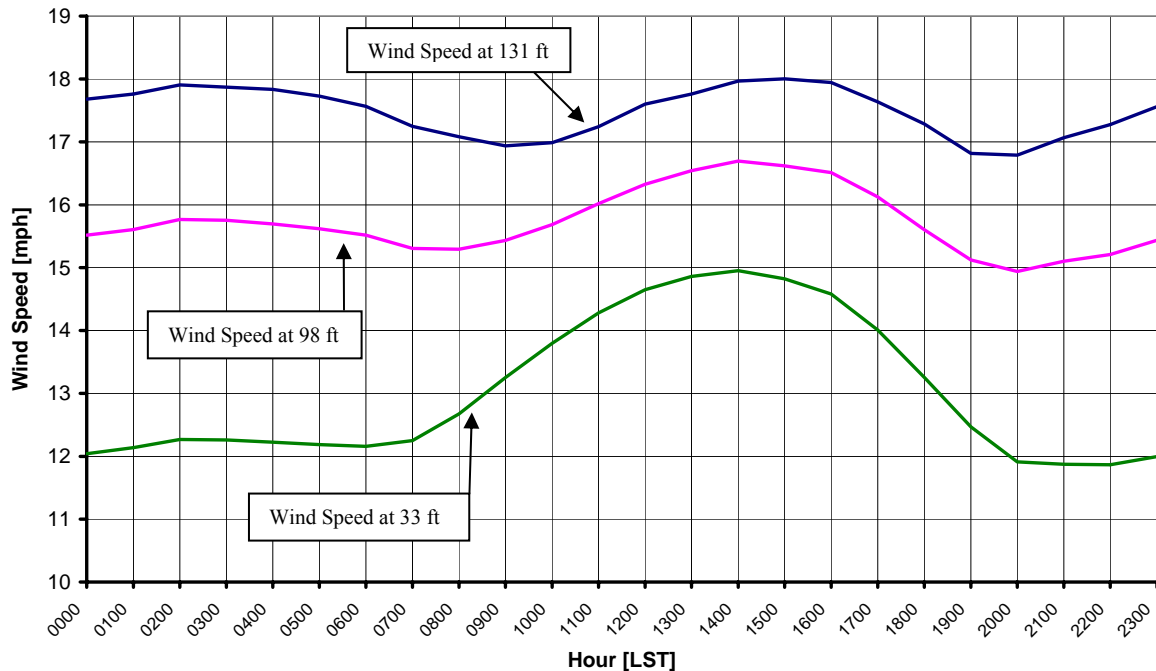
^b Above ground level.

^c Air temperature was not factored into calculations.

Average Hourly Wind Speeds

LST ^d	131 ft AGL		98 ft AGL		33 ft AGL	
	mph	m/s	mph	m/s	mph	m/s
0000	17.7	7.90	15.5	6.94	12.0	5.38
0100	17.8	7.94	15.6	6.98	12.1	5.43
0200	17.9	8.01	15.8	7.05	12.3	5.48
0300	17.9	7.99	15.8	7.04	12.3	5.48
0400	17.8	7.97	15.7	7.02	12.2	5.47
0500	17.7	7.93	15.6	6.98	12.2	5.45
0600	17.6	7.85	15.5	6.94	12.2	5.44
0700	17.2	7.71	15.3	6.84	12.2	5.48
0800	17.1	7.64	15.3	6.84	12.7	5.67
0900	16.9	7.57	15.4	6.90	13.3	5.92
1000	17.0	7.59	15.7	7.01	13.8	6.17
1100	17.2	7.71	16.0	7.16	14.3	6.38
1200	17.6	7.87	16.3	7.30	14.6	6.55
1300	17.8	7.94	16.5	7.40	14.9	6.64
1400	18.0	8.03	16.7	7.46	15.0	6.68
1500	18.0	8.05	16.6	7.43	14.8	6.63
1600	17.9	8.02	16.5	7.38	14.6	6.52
1700	17.6	7.89	16.1	7.21	14.0	6.26
1800	17.3	7.73	15.6	6.98	13.3	5.92
1900	16.8	7.52	15.1	6.76	12.5	5.57
2000	16.8	7.51	14.9	6.68	11.9	5.33
2100	17.1	7.63	15.1	6.75	11.9	5.31
2200	17.3	7.72	15.2	6.80	11.9	5.30
2300	17.6	7.85	15.4	6.90	12.0	5.36

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7/1/2000 – 6/30/2005



^d Local standard time.



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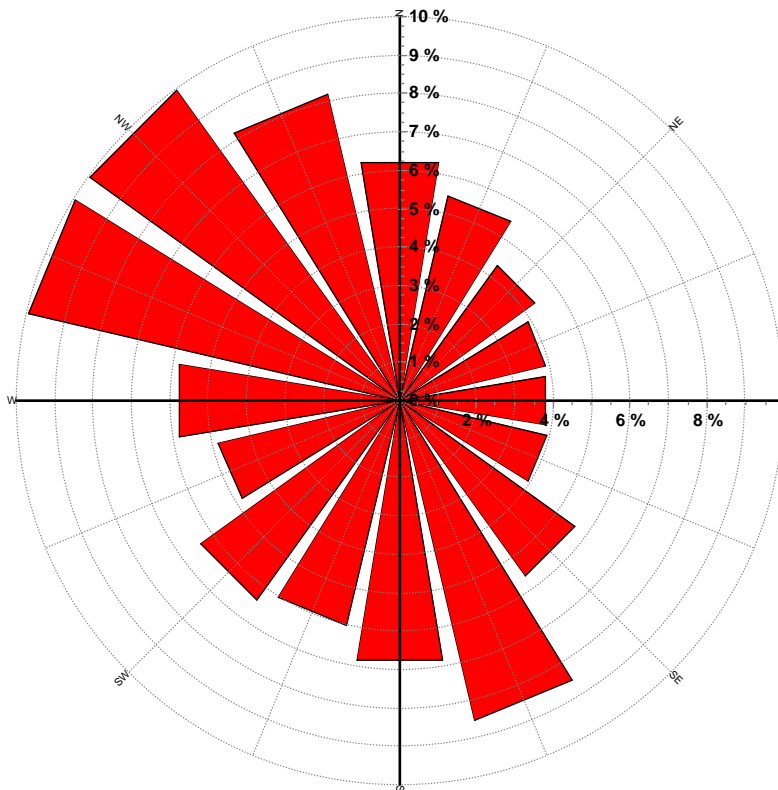
Wind Directional Frequency *

Winds from the... Frequency (%)

NNW	8.2
NW	10.0
WNW	9.9
W	5.8
WSW	4.9
SW	6.4
SSW	6.0
S	6.8
SSE	8.6
SE	5.6
ESE	3.9
E	3.8
ENE	3.9
NE	4.3
NNE	5.5
N	6.3

* Wind direction statistics are for 131 feet AGL.
Sensor stopped functioning on 8/7/2001.

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Wind Rose for 131-ft AGL
7/1/2000 - 8/7/2001



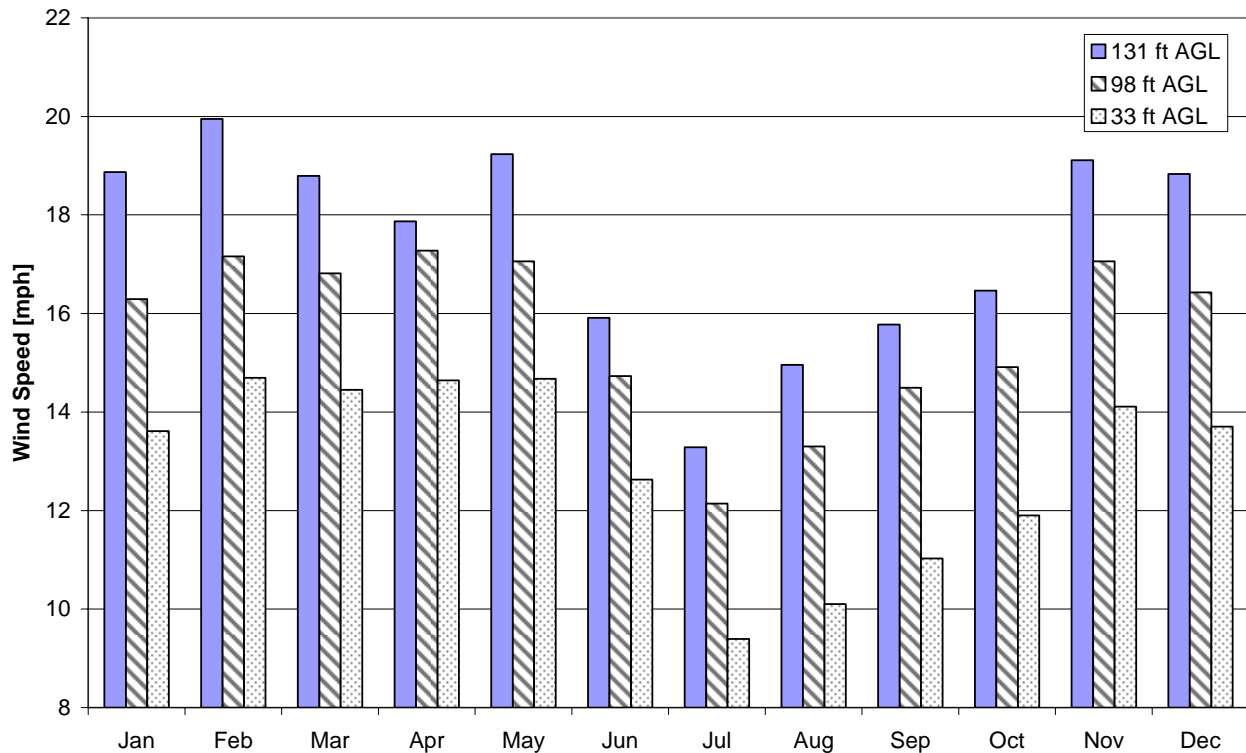
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Monthly Wind Speed Averages

Month	131 ft AGL		98 ft AGL		33 ft AGL	
	mph	m/s	mph	m/s	mph	m/s
Jan	18.9	8.44	16.3	7.28	13.6	6.08
Feb	19.9	8.92	17.2	7.67	14.7	6.57
Mar	18.8	8.40	16.8	7.52	14.4	6.46
Apr	17.9	7.99	17.3	7.72	14.6	6.55
May	19.2	8.60	17.1	7.63	14.7	6.56
Jun	15.9	7.11	14.7	6.59	12.6	5.64
Jul	13.3	5.94	12.1	5.43	9.4	4.20
Aug	15.0	6.69	13.3	5.95	10.1	4.52
Sep	15.8	7.05	14.5	6.48	11.0	4.93
Oct	16.5	7.36	14.9	6.67	11.9	5.32
Nov	19.1	8.54	17.1	7.63	14.1	6.31
Dec	18.8	8.42	16.4	7.34	13.7	6.13

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