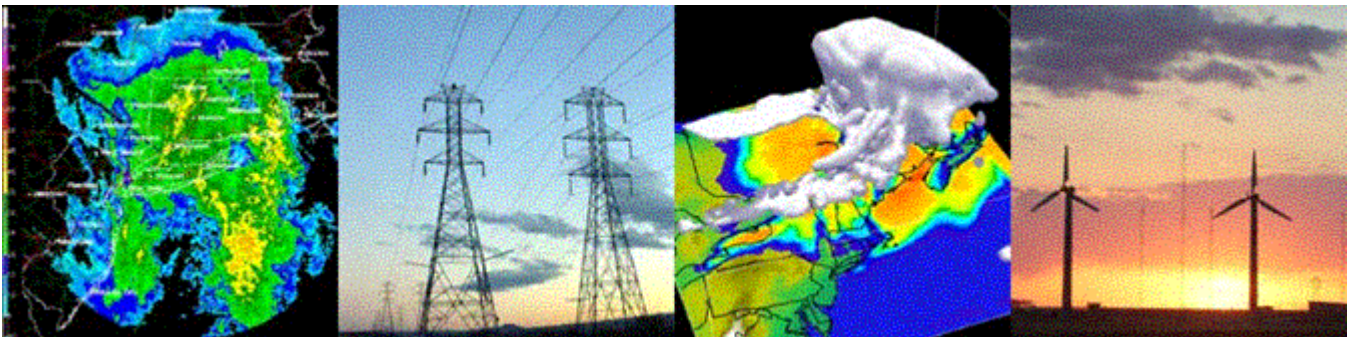




Wind Utility Consulting
Grinnell College
Wind Resource Analysis

August 11, 2006



Wind Utility Consulting Summary Report Grinnell College

Executive Summary

1. INTRODUCTION

Wind Utility Consulting engaged WindLogics to analyze the detailed wind characteristics of the Grinnell College site. The objective of this study is to provide an analysis of the overall wind regime, including a long-term estimation of the wind resource at 50 and 80 m above ground level (AGL), for one virtual tower located on the Grinnell College site (see Table 1). The site is located about 5 km northeast of the city of Grinnell in Poweshiek County, Iowa.

Tower	Latitude (WGS 84)	Longitude (WGS 84)	Elevation (in meters)
Tower 1	N 41.7928	W 92.6983	301

Table 1: Virtual Tower Location

2. SUMMARY OF RESULTS

2.1 Annual Wind Speed

At the virtual tower location, the annual average wind speed at 50 m above ground level (AGL) is 7.21 m/s. The annual average wind speed at 80 m AGL is 8.03 m/s.

2.2 Seasonal Characteristics

We typically see decreased wind speeds during the summer months and increased wind speeds during the transitional and cooler months. Table 2 displays the average seasonal wind speeds for each analysis height at the virtual tower location.

Tower	50 m AGL		80 m AGL	
	Oct - May	Jun - Sep	Oct - May	Jun - Sep
Tower 1	7.83	5.97	8.67	6.75

Table 2: Average Seasonal Wind Speed Values (in m/s) at the Virtual Tower Location

2.3 Meteorological Overview

The location and strength of the jet stream and related tracks of synoptic-scale weather systems dominate the meteorology of the Upper Midwest (i.e., low and high pressure systems). During the winter and transitional seasons, the Grinnell College site is influenced by transient and developing synoptic-scale weather systems associated with the cool/cold season jet stream position. These systems establish the pressure gradients that drive low-level winds. In the summer, the jet stream weakens and moves north, resulting in generally weaker synoptic systems and weaker winds.

NORMALIZED MONTHLY AND ANNUAL AVERAGE WIND SPEED VALUES

Normalized Monthly and Annual Wind Speed Averages (in m/s) Grinnell College - Tower 1 – 50 m

Month	m/s
January	8.36
February	7.73
March	8.41
April	7.76
May	7.53
June	6.47
July	5.45
August	5.49
September	6.48
October	7.50
November	7.76
December	7.62
Annual Average	7.21

Normalized Monthly and Annual Wind Speed Averages (in m/s) Grinnell College - Tower 1 – 80 m

Month	m/s
January	9.20
February	8.54
March	9.21
April	8.51
May	8.27
June	7.23
July	6.20
August	6.26
September	7.31
October	8.42
November	8.67
December	8.57
Annual Average	8.03

Mean quantities normalized to long-term average.
Data distributions representative of modeled year.