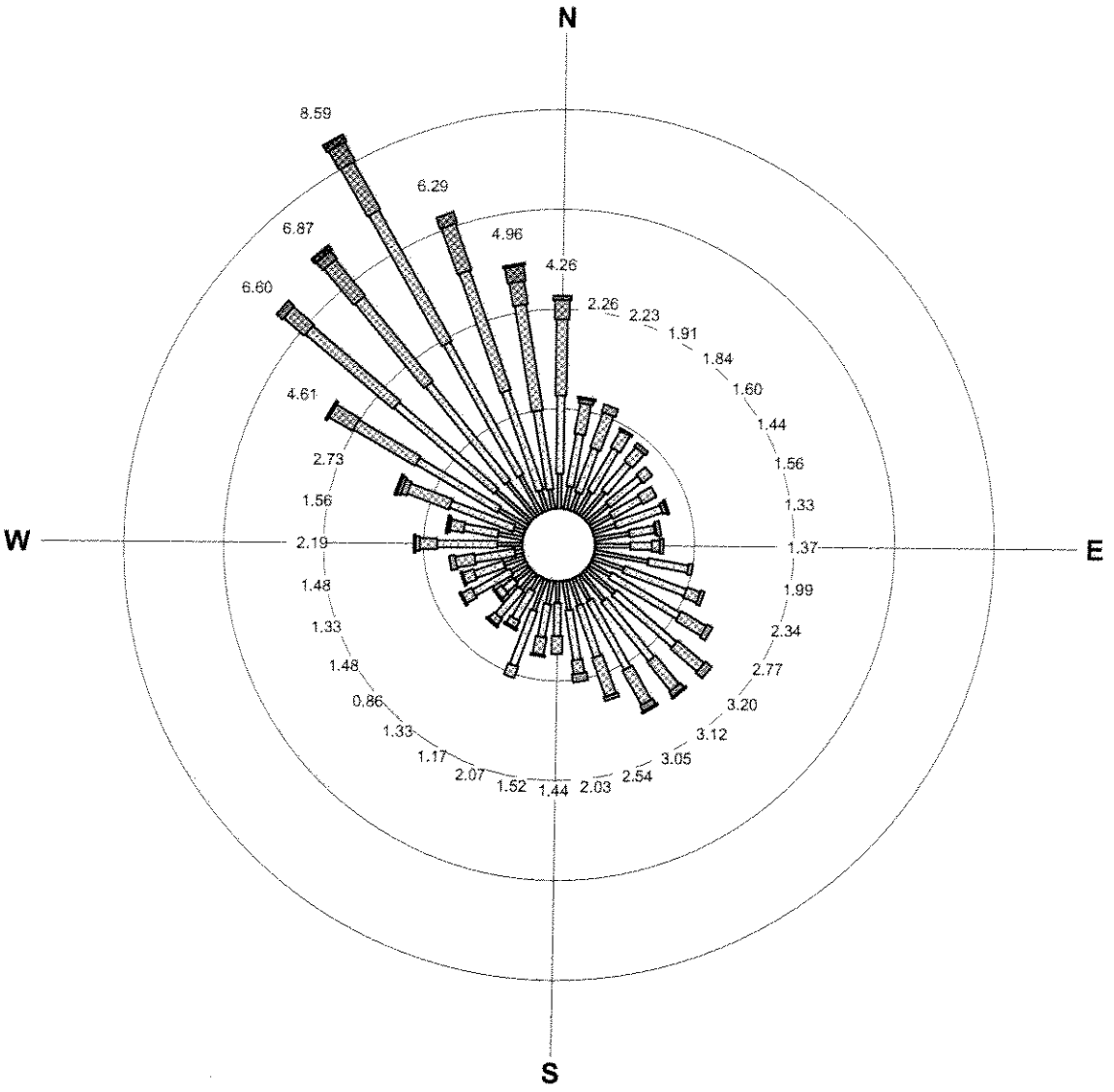
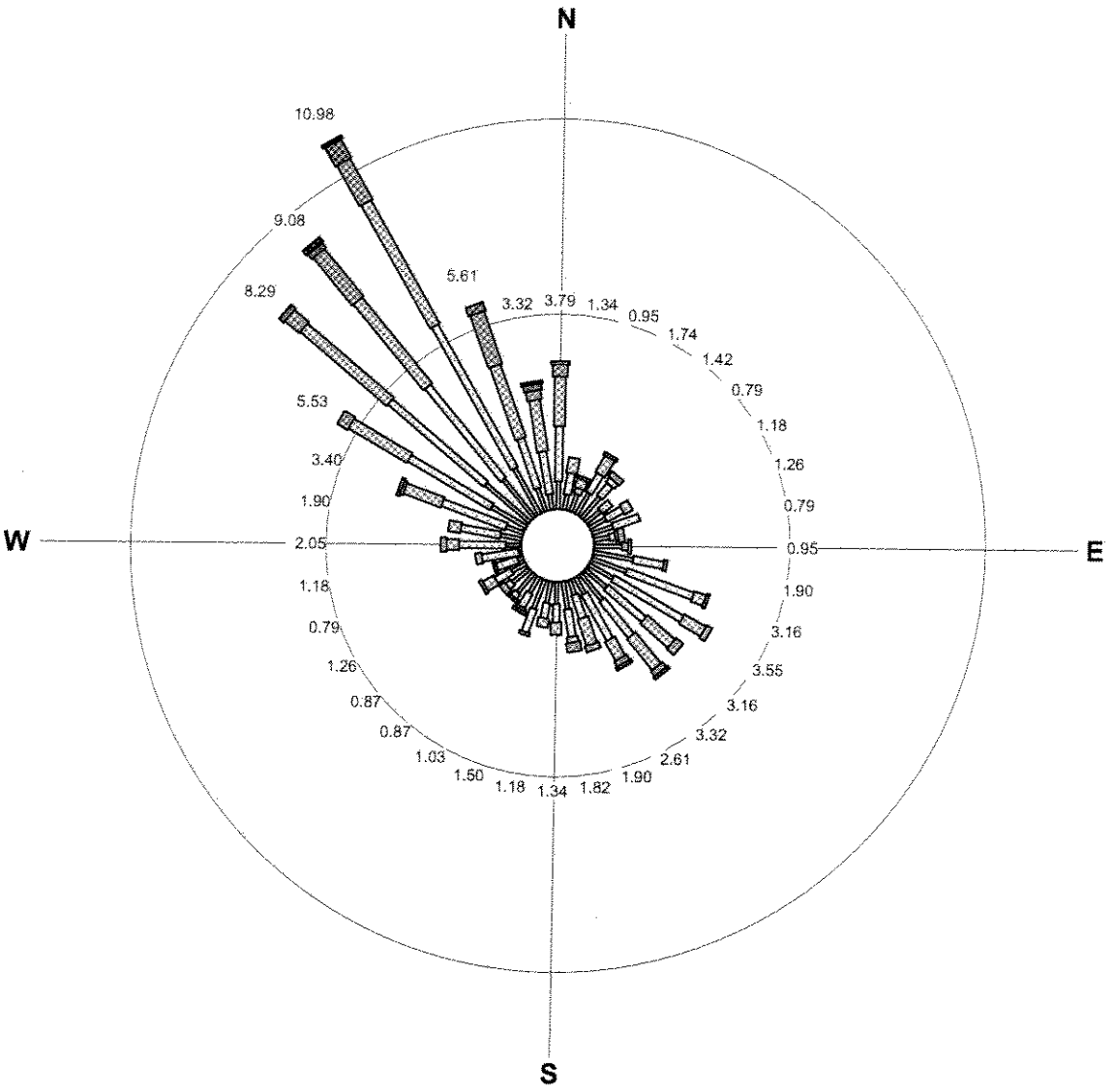
Figure 3.6
Daily Mean Wind Rose - Meadowbank Camp Station
September 1997 - August 2004



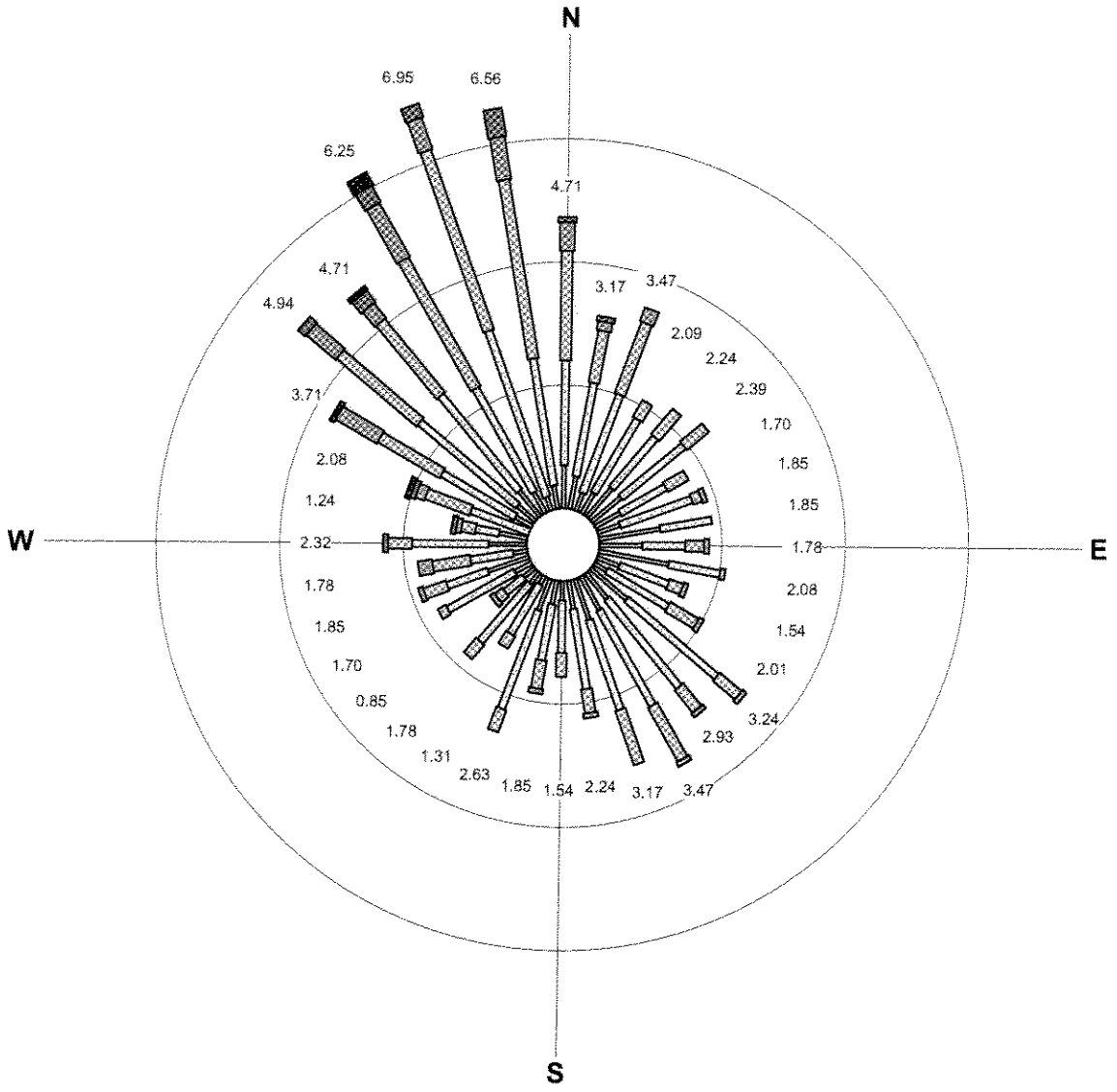
Calms excluded.
Rings drawn at 2% intervals.
Wind flow is FROM the directions shown.
2.07% of observations were missing.

Figure 3.7
Daily Mean Wind Rose - Meadowbank Camp Station
November through April (1997 - 2004)



Calms excluded.
Rings drawn at 5% intervals.
Wind flow is FROM the directions shown.
4.19% of observations were missing.

Figure 3.8
Daily Mean Wind Rose - Meadowbank Camp Station
May through October (1997 - 2004)

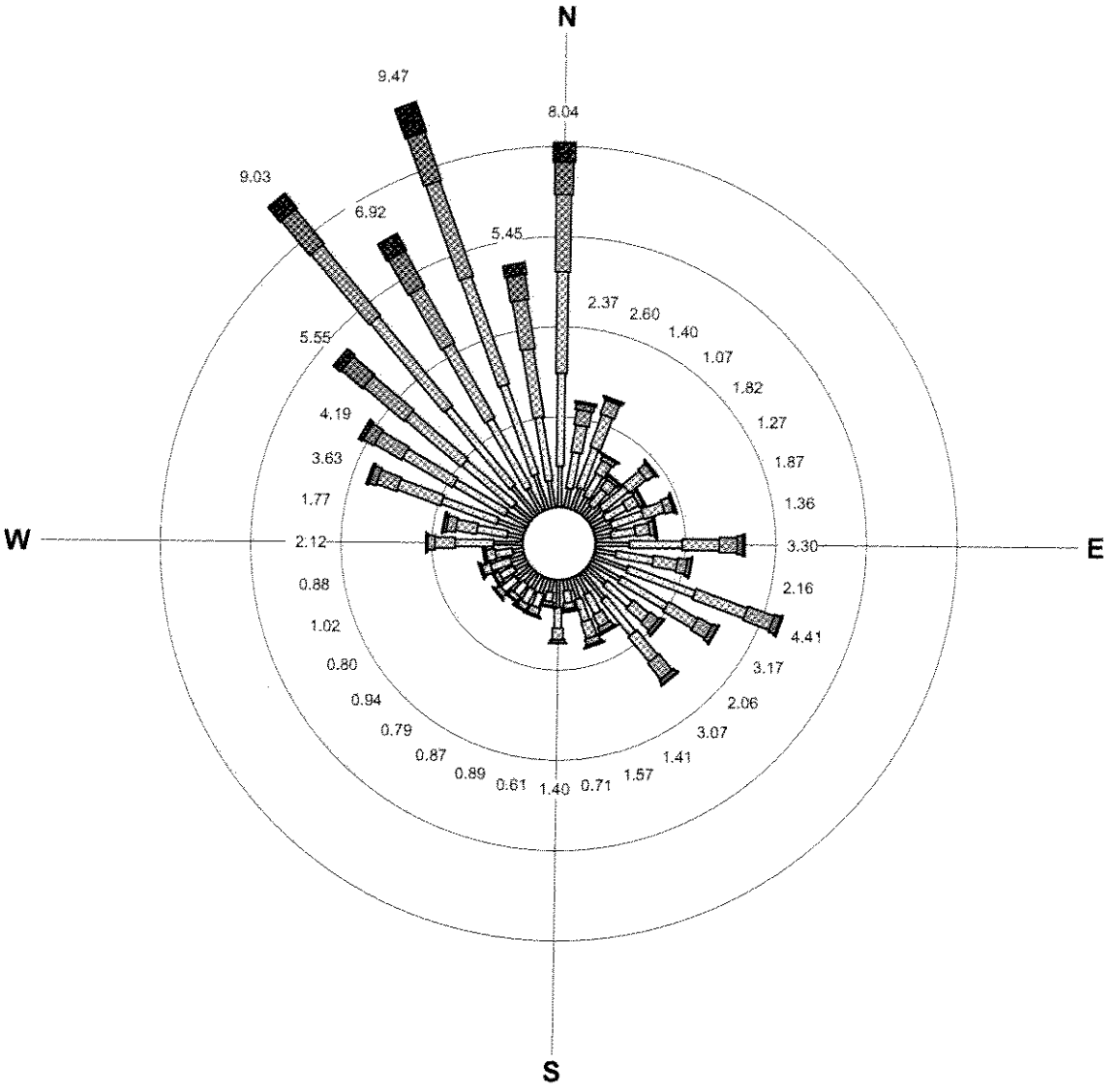


Calms excluded.
Rings drawn at 2% intervals.
Wind flow is FROM the directions shown.
No observations were missing.

Mean hourly wind speed and direction data have been collected at the Baker Lake climate station since October 1962. A plot depicting the hourly wind rose for the period of record at Baker Lake is shown on Figure 3.9. A plot of the Baker Lake hourly wind rose for the months November through April is shown in Figure 3.10. A plot of the Baker Lake hourly wind rose for the months May through October is shown in Figure 3.11.

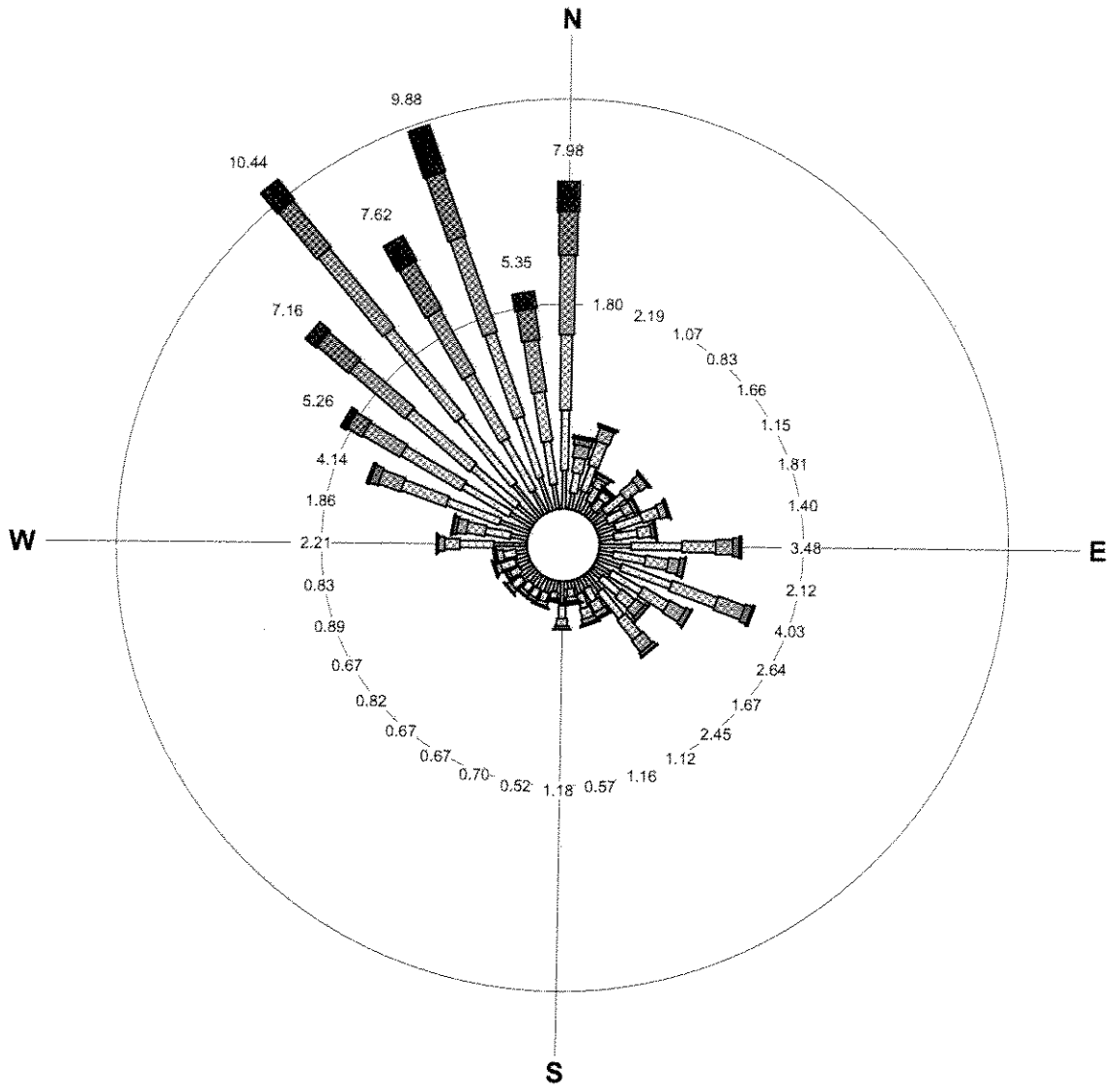
The maximum wind gust recorded at the Baker Lake climate station was 177 km/h on 6 June 1970. The annual maximum wind gusts and their corresponding maximum hourly mean wind speeds for Baker Lake are listed in Appendix B.14.

Figure 3.9
Mean Hourly Wind Rose - Baker Lake
1963 - 2004



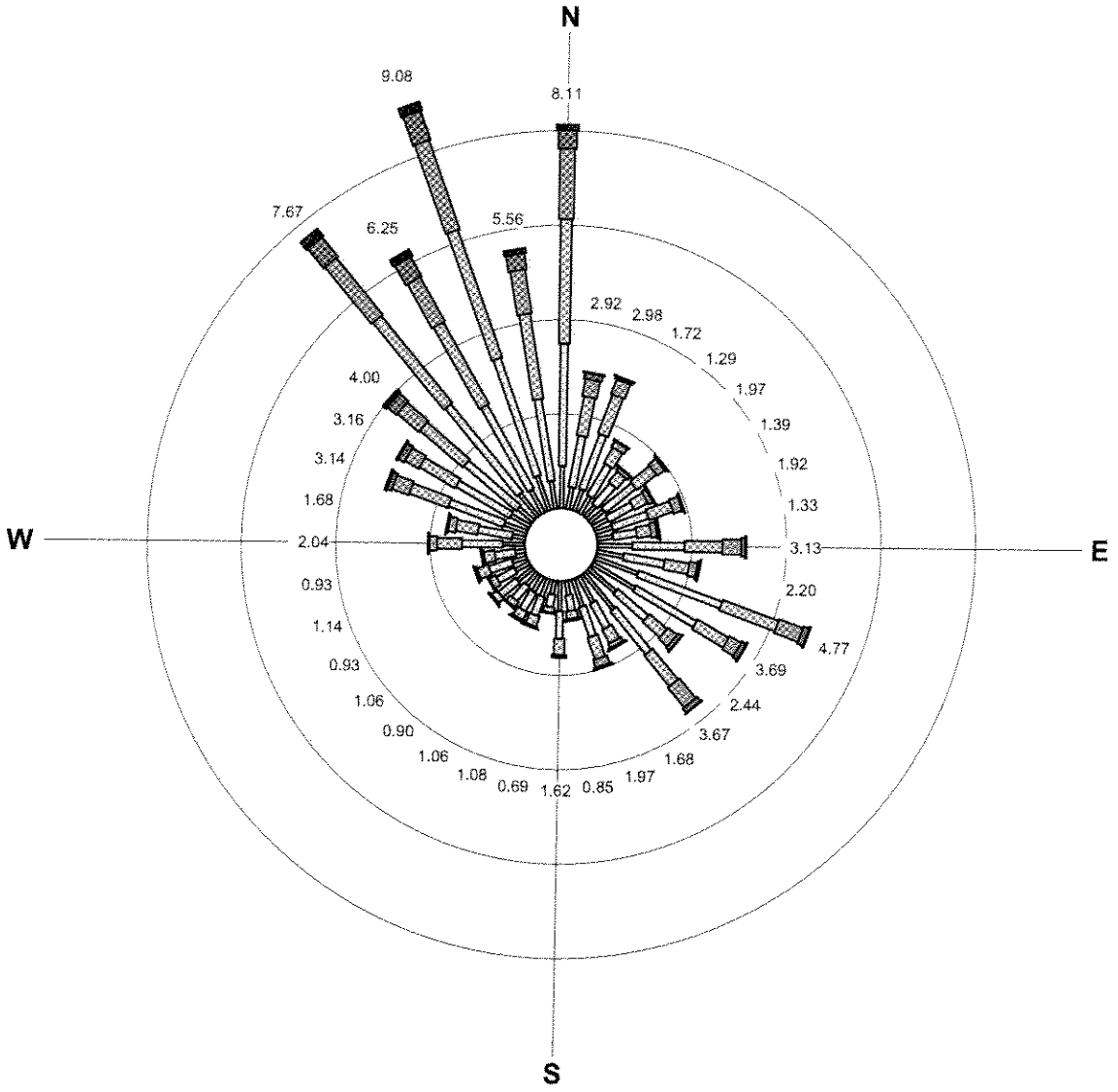
Calms excluded.
Rings drawn at 2% intervals.
Wind flow is FROM the directions shown.
126 observations were missing.

Figure 3.10
Mean Hourly Wind Rose - Baker Lake
November through April (1963 - 2004)



Calms excluded.
Rings drawn at 5% intervals.
Wind flow is FROM the directions shown.
113 observations were missing.

Figure 3.11
Mean Hourly Wind Rose - Baker Lake
May through October (1963 - 2004)



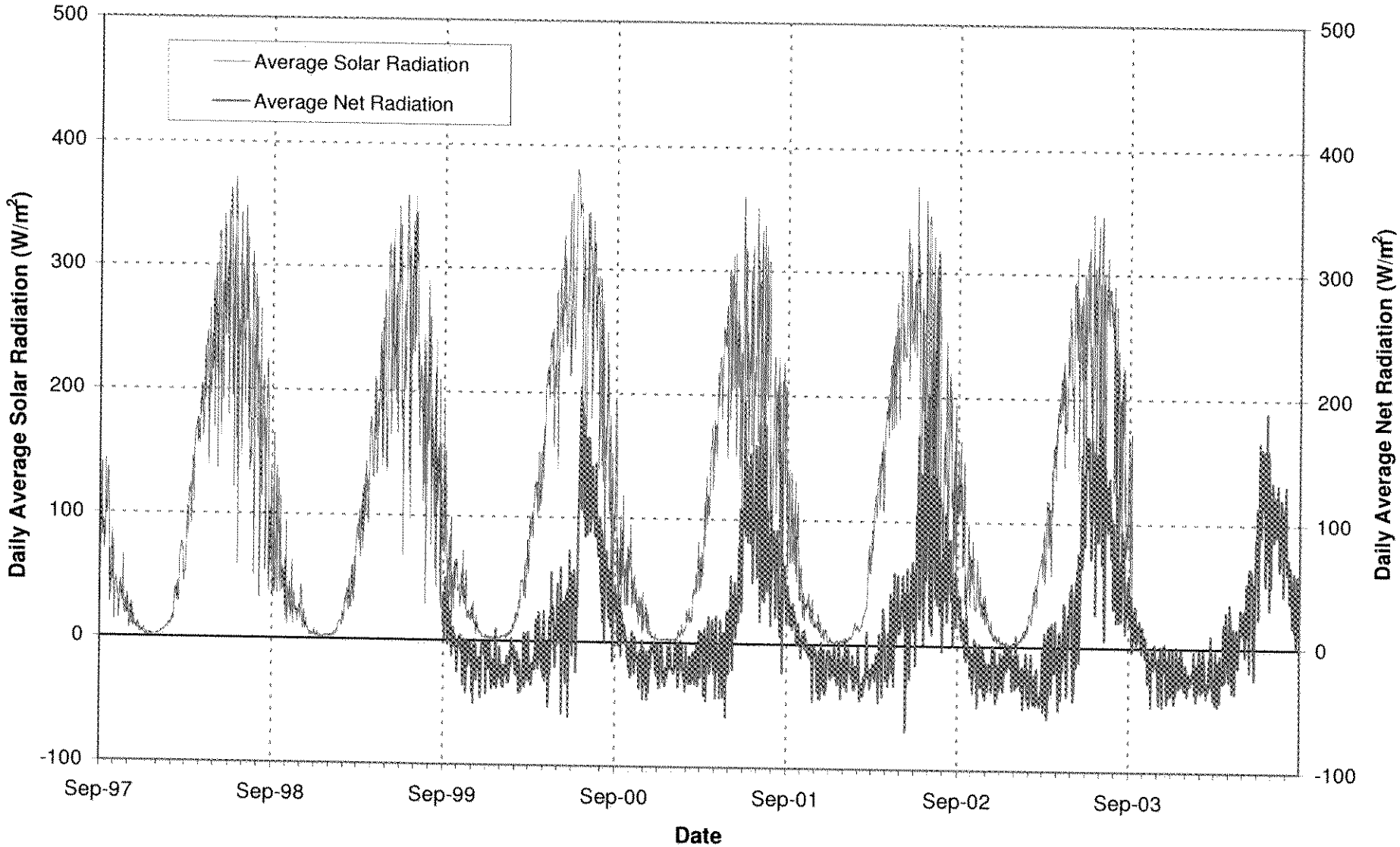
Calms excluded.
Rings drawn at 2% intervals.
Wind flow is FROM the directions shown.
13 observations were missing.

3.5 Solar and Net Radiation

Solar radiation drives the hydrologic cycle, affects the timing and intensity of snowmelt, evaporation, onset and break-up of lake ice, and the number of open water days, as well as being the main influence on air, soil and water temperatures.

Solar radiation has been measured at the Meadowbank Camp climate station since its inception in September 1997. Observation of net radiation at the Meadowbank Camp climate station started September 1999. Net radiation is the algebraic sum of incoming and outgoing all-wave radiation (short-wave and long-wave) resulting from both incident solar and far infrared radiation from the landscape. A plot of the net radiation and solar radiation is shown on Figure 3.12.

Daily Average Net Radiation and Daily Average Solar Radiation
Meadowbank Camp Station September 1997 to August 2004



P:\PROJECT\CW\1593.5\CLIMATE\MEADOWBANK\
Meadowbank wind & rad.xls [Net&Solar Radiation]
02/03/05

Cumberland Resources Ltd. - Meadowbank Gold Project
AMEC Earth & Environmental Limited

Figure 3.12

4.0 HYDROMETRIC MONITORING

4.1 Project Streamflow Monitoring

4.1.1 Hydrometric Stations

A surface water hydrology program to gather data for the project basins was initiated at the start of the 2002 runoff season. Four lake outlet discharge and water level monitoring stations were installed in June 2002 and operated continuously until they were shut down for the winter in September 2002. The four stations were again operated for the same months during the 2003 and 2004 seasons. This report incorporates the hydrometric data for all three years.

The surface water hydrology program consisted of monitoring lake levels and lake outlet discharges. Pre-runoff lake ice/water level and pre-springmelt snowcourse measurements could not be carried out in 2002 as the season was too far advanced when the monitoring program was initiated, however these measurements were carried out for the 2003 and 2004 seasons.

Hydrometric monitoring was conducted at the following stations:

- Third Portage Lake outlet (one station; three outlet channels);
- Tern Lake outlet;
- Drilltrail Lake outlet; and
- Second Portage Lake outlet.

The locations of the stations are shown on Figure 4.1 and photos are provided in Appendix A.

Tern Lake drains southeast into Drilltrail Lake, which drains south into Second Portage Lake (2PL). Third Portage Lake (3PL) drains north into 2PL across a narrow strip of land dividing the two lakes via three distinct outflow channels: a west channel, a center channel and an east channel. The west channel is located west of a prominent hill (Third Portage deposit) and the central channel is located east of the hill. The east channel is located a short distance east of the central channel, with only a low rise between. The west channel typically conveys the most flow during open water conditions and can be considered the main lake outlet channel.

The drainage areas for the four hydrometric stations were measured by delineation of the boundaries on 1:50,000 scale topographic mapping. The boundaries are shown on Figure 4.1 and a breakdown of areas is listed in Table 4.1, which includes: land surface area; surface area of the monitored lake (i.e., the lake on which the station is located); surface area and number of other lakes upstream of the monitored lake; total area of lake surfaces; total area of sub-basin; and ratio of lake area to total area.

Table 4.1 lists the values for each of the above area categories for the monitored sub-basin and for the total basin including all other upstream monitoring sites if any. The proportion of lake coverage area in the study area basins varies from 20% to 44% of the total basin area.