The climatic conditions for the two mineral leases are described below based on data obtained from the Bureau of Meteorology weather station at Milikapiti (Melville Island; Latitude -11.4258; Longitude 130.6758). This data is summarised in Table 3.1.

The study area is located in the wet/dry tropics of northern Australia, which is influenced by the north-west monsoon and has two distinct seasons, a wet and a dry season. Annual average rainfall is approximately 1,600 mm.

The wet season is characterised by high rainfall periods with approximately 90% of the annual rain falling between November through April, when monsoonal activity is prevalent and cyclonic activity is experienced. In the dry season, which falls between May and October, rainfall is minimal, although it exhibits greater variability compared to wet season falls.

Solar radiation and ambient temperatures are generally high throughout the year, with the maximum daily temperature averaging 33.8^{o}C (November) and the minimum daily temperatures average 18.1^{o}C (July). Annual relative humidity average is 78% at 9 am and 60% at 3 pm.

Table 3.1: Mean Climatic Conditions at Milikapiti, Melville Island (1959-2004)

Element	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean monthly rainfall mm	308.1	321.7	345.5	102.3	67.4	5.9	0.9	4.8	5.9	53.3	118.1	285.8	1619.7
Mean daily maximum temp ^{o}C	32	31.6	32	33.5	33	31.4	31.2	32	32.9	33.7	33.8	32.9	32.5
Mean daily minimum temp ^{o}C	23.7	24	23.7	22.7	21.1	19.2	18.1	19.9	21.7	23.3	24.1	24.1	22
Mean 9am relative humidity %	86	88	87	79	75	71	73	75	74	73	78	83	78
Mean 3pm relative humidity %	74	77	74	59	53	49	46	54	55	57	67	72	60
Mean monthly evaporation mm	200	200	200	175	200	175	200	225	225	225	200	175	2400
Mean monthly evapotransporation mm	120	100	140	100	70	50	50	70	90	110	110	120	1,130

Source: BOM (2005a)

The annual potential evaporation averages 2,400 mm (BOM 2005a), which greatly exceeds the annual average precipitation. The lowest rates of evaporation occur in the wet season from November through March and the highest occurs in the late dry season (August). These climatic conditions result in seasonal water-logging of the soils during the wet season, making access difficult in low lying areas.

The area is prone to cyclonic activity in the monsoonal season. The strongest and heaviest rains are associated with the passage of tropical cyclones, which can occur at any time during the period from November to April. The average frequency of occurrence for the thirty year period 1969/70 to 1998/99, for the study area, is approximately 0.4 cyclones per year (Figure 3.1).

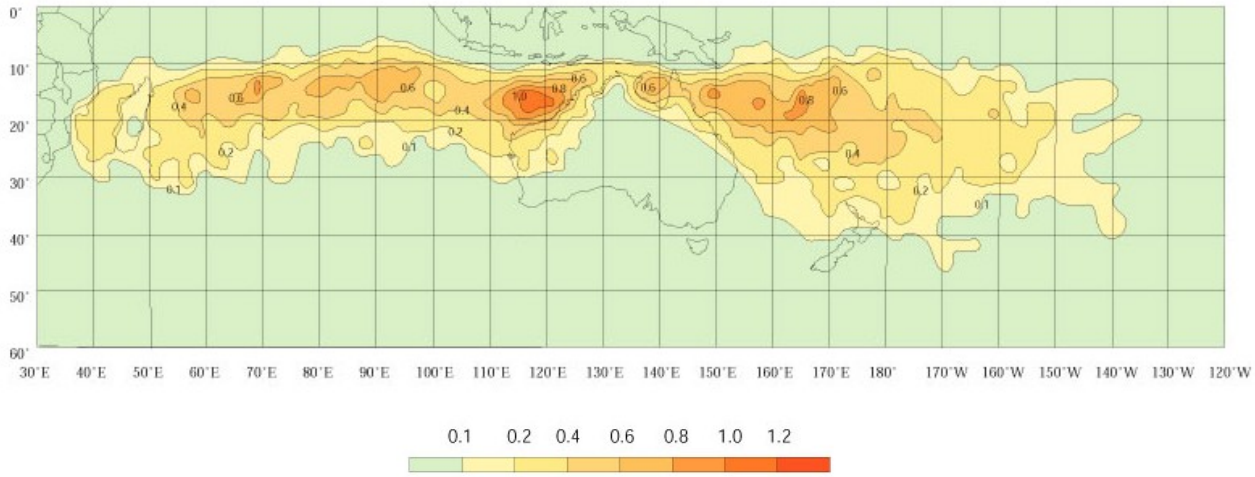

Figure 3.1: Average Annual Occurrence of Tropical Cyclones

Source: BOM (2005a) - for thirty-year period 1969/70 to 1998/99

Table 3.2 summarises each cyclone that has affected the Tiwi Islands coast since 1964, and Figure 3.2 shows the paths of tropical cyclones that have affected the northern Australian coastline over the past 20 years. The potential impact of each cyclone is unique and varies according to many factors such as its track, intensity, rainfall potential and size.

The main impacts of a cyclone are wind damage, storm surge, and flooding as a result of heavy rain. Storm surge events are of particular concern to coastal communities, and management of this risk has been incorporated into Matilda's operational planning.

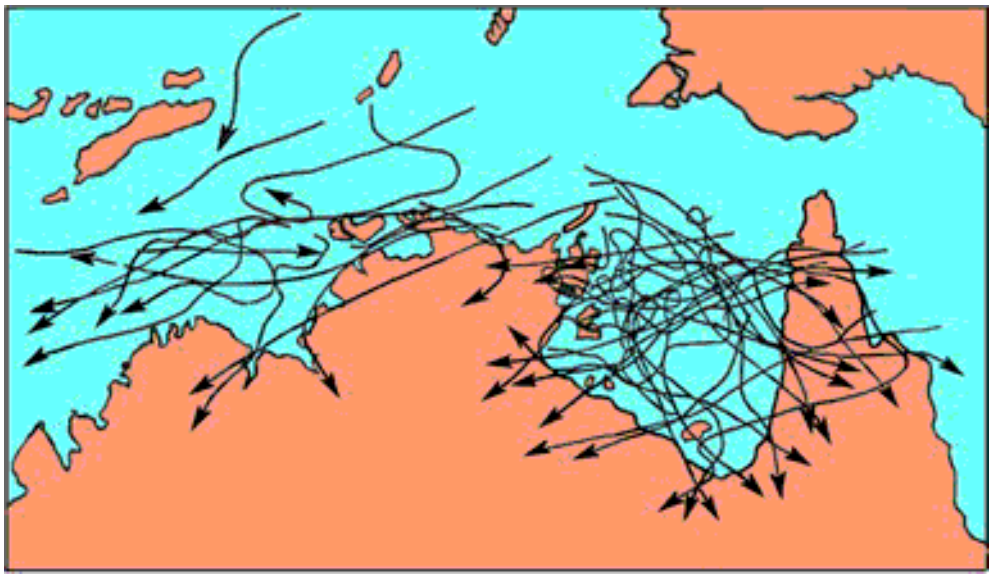

Figure 3.2: Paths of Tropical Cyclones over the past twenty years

Source: BOM (2005b)

Table 3.2: Tropical cyclones affecting the Tiwi Islands since 1964

Year	Name	Date	Category	Pressure (hPa)	Winds	Gusts	Rainfall 24hr
1964	Carmen	6-10 Mar	1	996	65km/hr		129mm Cape Don
1965	Marie	22 Feb – 1 Mar	2	984	93km/hr		170mm Maningrida
1965/66	Amanda	25 Dec – 2 Jan	1	990	90km/hr	76km/hr	152mm at Goulburn Is
1970	Beverley	26 Nov – 1 Dec	1	995	65km/hr	75km/hr	344mm at Elcho Is
1971	Kitty	2-5 Dec	1	1000	65km/hr Cape Don	93km/hr	282mm Cape Don
1973	Ines	17-21 Nov	3	970	130km/hr Troughton Is		264mm Murganella
1974	Selma	1-5 Dec	2	980	120km/hr		258mm Croker Is
1974	Tracy	20 Dec	4	950	217km/hr Darwin	240km/hr	250mm Darwin
1975	Wilma	11-14 Mar	2	980	120km/hr		154mm Darwin River
1977	Verna	28 Apr - 3 May	3	970	125km/hr		298mm Croker Is.
1981	Max	10-18 Mar	3	960	170km/hr		426mm at Maningrida
1985	Gretel	12-14 April	2	982	117km/hr		270mm Pt Stuart
1987	Kay	8-12 Apr	1	990	93km/hr		185mm Warruwi
1992	Neville	5-15 Apr	4	945	200km/hr	250km/hr	337mm Garden Pt
1996/97	Rachel	31 Dec - 8 Jan	2	980	80km/h	105km/hr	290mm in Darwin
1997	Sid	24-31 Dec	2	985	119km/hr		341mm Woologorang
1998	Thelma	1-14 Dec	5	925	174km/hr Troughton Is	320km/hr	430mm McMinns Lagoon
2003	Craig	7-13 Mar	2	980	74km/hr at Warruwi	129km/hr	164mm Ramingining
2004	Fay	13-19 Mar	5	949	100 km/hr		180mm Pt Fawcett
2005	Ingrid	3-16 Mar	5	925	230km/hr	323km/hr	438mm Truscott

Source: BOM (2005b)