CLIMATIC WATER BALANCE

It is a simple calculation that assists in deciding whether leachate management is required or not. It therefore provides a conservative means of determining whether or not significant leachate generation will occur. The Climatic Water Balance (B) is calculated using only the two climatic components of the full water balance, namely Rainfall (R) and Evaporation (E).

The Climatic Water Balance is defined by: B = R – E

Where:
B is the Climatic Water Balance in mm of water
R is the rainfall in mm of water
E is the evaporation from a soil surface in mm of water.

This is calculated for the wet season of the wettest year on record wettest. The data used are the precipitation and A-pan evaporation obtained from the latest edition of the Department of Water and Sanitation's evaporation and precipitation records. The most representative / closest weather station was H4E007 - Doorn River @ Kwaggaskloof Dam. The total of the wettest 6 months for this specific area is calculated from April to September.

Source:
http://www.dwa.gov.za/Hydrology/Verified/HyDataSets.aspx?Station=H4E007

The factor of 0,70 used to convert A-pan evaporation to soil evaporation

Year	Climatic Water Balance (B)	Rainfall - R	Evaporation - E	0.70 factor applied
2013/14	-45.64	371	595.2	416.64
1995/96	-80.14	391.1	673.2	471.24
1984/85	-77.89	369.2	638.7	447.09
2007/08	-100.24	322.7	604.2	422.94
1980/81	-200.3	271.5	674	471.8
1992/93	-24.36	384.3	583.8	408.66
2008/09	-10.08	384.3	563.4	394.38
1998/99	-161.72	286	639.6	447.72
1985/86	-162.19	238.7	572.7	400.89
1988/89	-101.79	286.5	554.7	388.29

B has been consistently calculated as negative and the site therefore falls within a water deficit area. According to statistics sites with a climatic balance as depicted above would be classified as B^- and would not generate significant leachate on account of the climate.

No leachate management system would be required in terms of the Climatic Water Balance.

The calculation is conservative as it ignores run-off and thus assumes that all precipitation will infiltrate. The calculation also ignores the moisture storage capacity of the site in this instance would be the cultivated areas.