

# SCHOOL WATER USE ESTIMATION TOOL

## Introduction:

This tool has been designed to assist School managers with the management of their utility accounts. Water costs are becoming increasingly burdensome to school governing bodies, with little or no guidance available for these management teams to assess their water consumption against projected targets.

The calculations performed within this tool are formulated to calculate estimated water consumption in the following major aspects of the school:

- Water consumed by occupants. This is water used mainly in ablutions, for drinking and teaching processes;
- Water consumed by the irrigation of grassed sports fields;
- Water consumed by the irrigation of landscaped gardens and lawns.

## Instructions for use:

This assessment tool requires broad based information relating to the school, which is gathered and manipulated in the following sections:

- **Section 1: Population loading of the school premises**

Schools are encouraged to become centres of community life. This requires that the population of the school is estimated, or measured, during the various utilisation periods of a typical week. These population estimates are tabulated in this section and multiplied by a conversion factor, to derive a total "Full time equivalent" (FTE) population equivalent for the school. One FTE is defined as the equivalent of one person (learner, educator or administrative staff member) attending the school, for the normal duration of a school day, from 07h30 to 13h30.

- **Section 2: Staff and hostel accommodation on the school premises**

The population loading of permanent and hostel accommodation is determined in this section. No allowance is made for additional water intensive processes occurring within hostels, such as on-site laundries or kitchens. This approach may be modified in later releases of this tool, after further investigation into the water demands of these processes.

- **Section 3: Irrigated grassed sports fields, lawns and gardens**

This section gathers information required for the calculation of estimated water demands for external landscaped areas, including sports fields and gardens. A lookup table is included for the estimation of regional irrigation water demand, based on meteorological data analysed during a five year period, for the major cities in South Africa.

- **Section 4: Estimated water use**

The data gathered in Sections 1 to 3 are now manipulated into estimated water use within the three major processes listed above. School managers may now compare billed utility consumption against the total estimated water consumption.

## SECTION 1

### Population loading of the school premises:

Enter the total number of persons on the school premises during each period into column A. This includes platoon school, double sessions, community or commercial use of the school or grounds.

*Note: Hostel boarders and staff accommodated on site should only be included during school hours.*

Multiply column A by the factor in column B and write the result into the "Result" column. Total the values in the result column, writing this total into the block labeled "Total 1".

Period		Population	Factor	Result
		A	B	A x B
Weekdays	Morning	Value 1	147	
	Afternoon		49	
	Evening		49	
Saturdays	Morning		20	
	Afternoon		10	
	Evening		15	
Sundays	Morning		17.3	
	Afternoon		26	
	Evening		26	
<b>Total of the result column:</b>			<b>Total 2</b>	

## SECTION 2

### Staff and Hostel accommodation on the school premises:

Multiply column A by the factor in column B and write the result into the "Result" column. Total the values in the result column, writing this total into the block labeled "Total 2".

Period	Population	Factor	Result
	A	B	A x B
Total number of OCCUPIED hostel beds		441	
Number of beds occupied over weekends		200	
Total number of staff accommodated on site, including family members normally living with the staff member		1313	
			<b>Total 3</b>

## SECTION 3

### Irrigated grassed sports fields, lawns and gardens:

This is the number of grassed sports fields on the premises which are irrigated using water from the mains water supply. Where a field is used for multiple purposes (e.g.: Athletics and rugby) this fields should be counted once only.

Multiply column A by the factor in column B and write the result into the "Result" column. Total the values in the result column, writing this total into the block labeled "Total 3".

Grassed sport field type (Count grassed fields once only)	No. of fields A	Factor B	Result A x B
Athletics		10400	
Basketball		600	
Netball		612	
Hockey		6656	
Rugby / Soccer		8800	
Cricket		10400	
Tennis		450	
Baseball		6400	
		<b>Total 4</b>	

Evaluation criteria	Evaluation Value A	Factor B	Result A x B												
What is the condition of irrigated sports fields? Select a value from the table below and enter this value in column "A": <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr style="background-color: #000080; color: white;"> <th style="text-align: left;">Condition</th> <th style="text-align: center;">Value</th> </tr> </thead> <tbody> <tr> <td>Poor condition</td> <td style="text-align: center;">1</td> </tr> <tr> <td></td> <td style="text-align: center;">2</td> </tr> <tr> <td>Fair condition</td> <td style="text-align: center;">3</td> </tr> <tr> <td></td> <td style="text-align: center;">4</td> </tr> <tr> <td>Excellent condition</td> <td style="text-align: center;">5</td> </tr> </tbody> </table>	Condition	Value	Poor condition	1		2	Fair condition	3		4	Excellent condition	5		0.2	Value 5
Condition	Value														
Poor condition	1														
	2														
Fair condition	3														
	4														
Excellent condition	5														
What is the extent of irrigated planted gardens and lawns over the school site? Select a value from the table below and enter this value in column "A": <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr style="background-color: #000080; color: white;"> <th style="text-align: left;">Extent of gardens and lawns</th> <th style="text-align: center;">Value</th> </tr> </thead> <tbody> <tr> <td>Small area</td> <td style="text-align: center;">1</td> </tr> <tr> <td></td> <td style="text-align: center;">2</td> </tr> <tr> <td></td> <td style="text-align: center;">3</td> </tr> <tr> <td></td> <td style="text-align: center;">4</td> </tr> <tr> <td>Extensive area</td> <td style="text-align: center;">5</td> </tr> </tbody> </table>	Extent of gardens and lawns	Value	Small area	1		2		3		4	Extensive area	5		1.73	Value 6
Extent of gardens and lawns	Value														
Small area	1														
	2														
	3														
	4														
Extensive area	5														

Evaluation criteria	Evaluation Value A	Factor B	Result A x B												
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Condition	Value														
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Question	Answer
What percentage of the irrigated gardens and lawns (excluding sports fields) are irrigated using water from the mains supply?	Value 8 %
Look up the "Supplementary irrigation requirement" for the city region closest to the school, from Table 1 below, and enter the result against "Value 8":	Value 9

**Table 1: Supplementary irrigation required for grassed playing surfaces (litres / m<sup>2</sup>)**

Region	Additional irrigation requirement (litres / m <sup>2</sup> )	Region	Additional irrigation requirement (litres / m <sup>2</sup> )	Region	Additional irrigation requirement (litres / m <sup>2</sup> )
Bloemfontein	563	Kimberley	639	Port Elizabeth	559
Cape Town	684	Ladysmith	481	Pretoria	483
De Aar	730	Messina	694	Richards Bay	265
Durban	388	Mosselbaai	713	Saldhana	821
East London	458	Pietermaritzburg	406	Umtata	427
Johannesburg	445	Polokwane	618	Upington	808

## SECTION 4

### Calculation of estimated water use:

Transfer the values, as indicated, and perform the calculations required by the following tables:

	Value A	Factor B	Result A x B
Transfer value from <b>TOTAL 2</b>		0,025	
Transfer value from <b>TOTAL 3</b>		0,025	
<b>TOTAL OCCUPANT WATER USE PER ANNUM (KILOLITRES):</b>	Total 10		

Transfer the value  
of **VALUE 6**

-  =

Transfer the value  
of **VALUE 1**

x  =

Transfer the value  
of **VALUE 7**

x  =

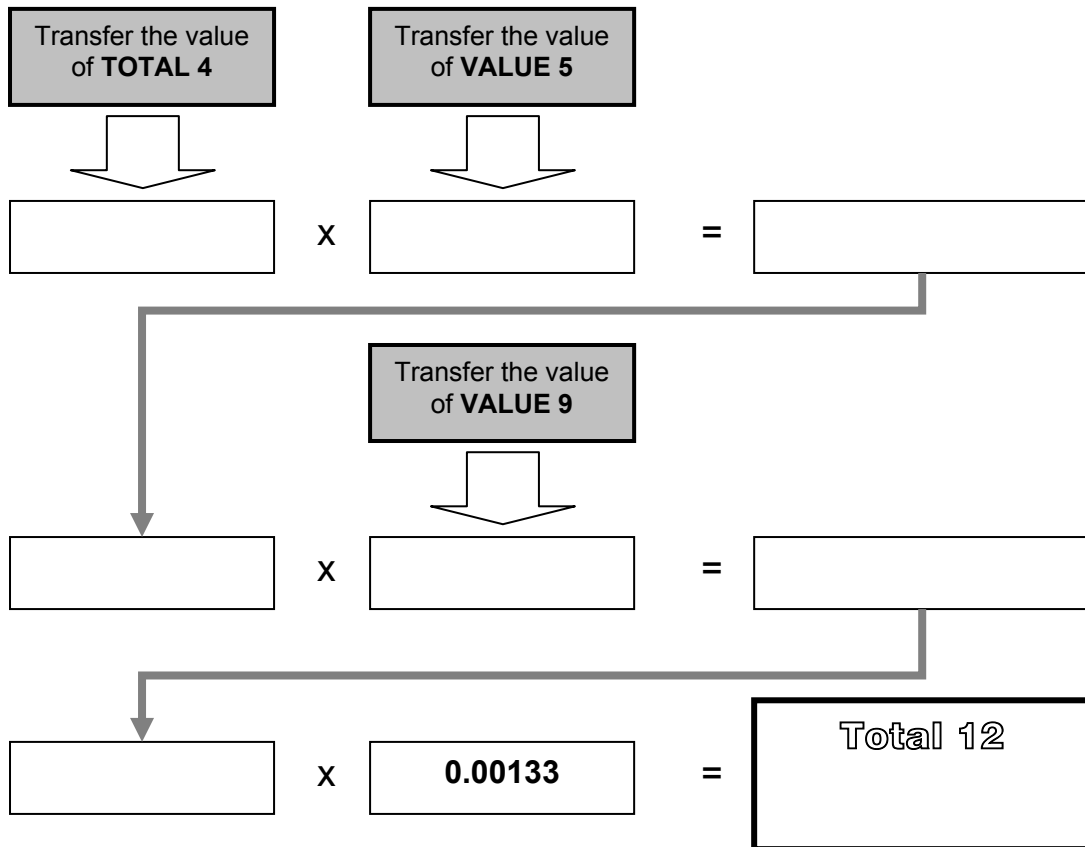
Transfer the value  
of **VALUE 8**

x  =

Transfer the value  
of **VALUE 9**

x  =

x  =



## SECTION 5

**Summary:**

Transfer the total water consumption for each aspect of the school, as indicated below, and total these figures to derive estimated total annual mains water consumption for the school.

SUMMARY	Transfer from	Value
Total Occupant water use	<b>Total 10</b>	
Total planted gardens and lawns irrigation use	<b>Total 11</b>	
Total Sports Field irrigation use	<b>Total 12</b>	
<b>TOTAL ESTIMATED SCHOOL WATER USE PER ANNUM (KILOLITRES):</b>		