Victorian Land Capability Assessment Framework

Please read the attached notes before using this spreadsheet

Irrigation area sizing using Nominated Area Water Balance & Storage Calculations

Site Address:	**Lot 585 Bundalaguah Road, Maffra**																
Date:				**Assessor:**													
INPUT DATA																	
Design Wastewater Flow	Q	750	L/day	Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2013)													
Design Irrigation Rate	DIR	3.5	mm/day	Based on soil texture class/permeability and derived from Table 9 in the EPA Code of Practice (2013)													
Nominated Land Application Area	L	267	m^2	[1]													
Crop Factor	C	0.6-0.8	unitless	Estimates evapotranspiration as a fraction of pan evaporation; varies with season and crop type[2]													
Rainfall Runoff Factor	RF	1	untiless	Proportion of rainfall that remains onsite and infiltrates, allowing for any runoff													
Mean Monthly Rainfall Data	East Sale Airport (085072)			BoM Station and number													
Mean Monthly Pan Evaporation Data	East Sale Airport (085072)			BoM Station and number													

Parameter	Symbol	Formula	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days in month	D		days	31	28	31	30	31	30	31	31	30	31	30	31	**365**
Rainfall	R		mm/month	45.4	42.5	48.9	48.2	51.7	45.7	41.4	46	51.7	58.1	63.8	54.3	**597.7**
Evaporation	E		mm/month	198.4	162.4	136.4	87	52.7	42	46.5	65.1	93	124	153	186	**1346.5**
Crop Factor	C		unitless	0.80	0.80	0.70	0.70	0.60	0.60	0.60	0.60	0.70	0.80	0.80	0.80	
OUTPUTS																
Evapotranspiration	ET	ExC	mm/month	159	130	95	61	32	25	28	39	65	99	122	149	**1004.3**
Percolation	B	DIRxD	mm/month	108.5	98	108.5	105.0	108.5	105.0	108.5	108.5	105.0	108.5	105.0	108.5	**1277.5**
Outputs		ET+B	mm/month	267.2	227.92	204.0	165.9	140.1	130.2	136.4	147.6	170.1	207.7	227.4	257.3	**2281.8**
INPUTS																
Retained Rainfall	RR	RxRF	mm/month	45.4	42.5	48.9	48.2	51.7	45.7	41.4	46	51.7	58.1	63.8	54.3	**597.7**
Applied Effluent	W	(QxD)/L	mm/month	87.1	78.7	87.1	84.3	87.1	84.3	87.1	87.1	84.3	87.1	84.3	87.1	**1025.3**
Inputs		RR+W	mm/month	132.5	121.2	136.0	132.5	138.8	130.0	128.5	133.1	136.0	145.2	148.1	141.4	**1623.0**
STORAGE CALCULATION																
Storage remaining from previous month			mm/month	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Storage for the month	S	(RR+W)-(ET+B)	mm/month	-134.7	-106.8	-68.0	-33.4	-1.3	-0.2	-7.9	-14.5	-34.1	-62.5	-79.3	-115.9	
Cumulative Storage	M		mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Maximum Storage for Nominated Area	N		mm	0.00												
	V	NxL	L	0												
LAND AREA REQUIRED FOR ZERO STORAGE			m^2	105	113	150	191	263	266	245	229	190	155	138	115	

MINIMUM AREA REQUIRED FOR ZERO STORAGE: 267.0 m^2

CELLS

	Please enter data in blue cells
XX	Red cells are automatically populated by the spreadsheet
XX	Data in yellow cells is calculated by the spreadsheet, DO NOT ALTER THESE CELLS

NOTES

[1] This value should be the largest of the following: land application area required based on the most limiting nutrient balance or minimum area required for zero storage

[2] Values selected are suitable for pasture grass in Victoria

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Nutrient Balance

Site Address: Lot 585 Bundalaguah Road, Maffra

SUMMARY - LAND APPLICATION AREA REQUIRED BASED ON MOST LIMITING NUTRIENT BALANCE 249 m^2

INPUT DATA[1]

Wastewater Loading			Nutrient Crop Uptake					
Hydraulic Load	750	L/day	Crop N Uptake	220	kg/ha/yr	which equals	60.27	$mg/m^2/day$
Effluent N Concentration	25	mg/L						
% N Lost to Soil Processes (Geary & Gardner 1996)	0.2	Decimal						
Total N Loss to Soil	3750	mg/day						
Remaining N Load after soil loss	15000	mg/day						

NUTRIENT BALANCE BASED ON ANNUAL CROP UPTAKE RATES

Minimum Area required with zero buffer			Determination of Buffer Zone Size for a Nominated Land Application Area (LAA)		
Nitrogen	249	m^2	Nominated LAA Size	267	m^2
			Predicted N Export from LAA	-0.40	kg/year
			Minimum Buffer Required for excess nutrient	0	m^2

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NOTES

[1] Model sensitivity to input parameters will affect the accuracy of the result obtained. Where possible site specific data should be used. Otherwise data should be obtained from a reliable source such as:

- *EPA Guidelines for Effluent Irrigation*
- *Appropriate Peer Reviewed Papers*
- *Environment and Health Protection Guidelines: Onsite Sewage Management for Single Households*
- *USEPA Onsite Systems Manual*