

Nominated Area Water Balance & Storage Calculations - Wick Trench Design (EPA compliant)

Site Address: **Lavers Hill (Wyelangta) Secondary Effluent - Wick Trench 4 bedrooms**

INPUT DATA DO NOT MODIFY CELLS IN BLUE

Design Wastewater Flow	Q	900	L/day
Daily DLR		12.0	mm/day
Nominated Land Application Area	L	139.0	m sq
Crop Factor	C	0.5-0.7	unitless
Retained Rainfall	RR	0.85	unitless
Void Space Ratio	V	0.45	unitless
Rainfall Data	Wyelangta		
Evaporation Data	Lavers Hill (Wyelangta)		

Estimated daily load from 4 bedroom residential property, with standard water fixtures and town water
 Enter DLR from table at right based on Appendix A Table 9 EPA Code of Practice (2013) for limiting soil horizon
 Used for iterative purposes to determine storage requirements based on nominated trench/bed bottom area
 Estimates evapotranspiration as a fraction of ET_0 ; varies with season and crop type (from EPA 168)
 Proportion of rainfall that remains onsite and infiltrates; function of slope/cover, allowing for any runoff
 Proportion of trench that is available for storage (assumes arch drain)
 BoM 70th percentile monthly
 SILO Data Drill Average monthly

Bed Water available (days) = **90**

Soil Category (AS1547:2012)	DLR
Gravels & Sands (1)	NS
Sandy Loams (2) Loams (3) High/Mod Clay Loams (4a)	NS
Weak Clay Loams (4b)	20
Massive Clay Loams (4)	10
Strong Light Clays (5a)	12
Moderate Light Clays (5b)	10
Weak Light Clays (5c)	8
Medium to Heavy Clays (6)	5

Parameter	Symbol	Formula	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total	
Days in month	D	\	days	31	28	31	30	31	30	31	31	30	31	30	31	31	28	31	30	31	30	365	
Rainfall	R	\	mm/month	107.6	108.1	125.3	191.7	231.8	231.1	266.1	274.4	220.9	207.3	172.4	141.8	107.6	108.1	125.3	191.7	231.8	231.1	2,278.5	
Potential Evapotranspiration	ET_0	\	mm/month	121.0	99.7	82.9	51.2	31.7	21.5	24.9	36.4	52.4	76.5	92.8	111.6	121.0	99.7	82.9	51.2	31.7	21.5	802.6	
Crop Factor	C			0.70	0.70	0.70	0.60	0.50	0.45	0.40	0.45	0.55	0.65	0.70	0.70	0.70	0.70	0.70	0.60	0.50	0.45		
OUTPUTS (LOSSES)																							
Evapotranspiration	ET	$ET_0 \times C$	mm/month	84.7	69.8	58.0	30.7	15.9	9.7	9.9	16.4	28.8	49.7	65.0	78.1	84.7	69.8	58.0	30.7	15.9	9.7	516.7	
Percolation	B	(DLR) \times D	mm/month	372.0	336.0	372.0	360.0	372.0	360.0	372.0	372.0	360.0	372.0	360.0	372.0	372.0	336.0	372.0	360.0	372.0	360.0	4,380.0	
Outputs		ET+B	mm/month	456.7	405.8	430.0	390.7	387.9	369.7	381.9	388.4	388.8	421.7	425.0	450.1	456.7	405.8	430.0	390.7	387.9	369.7	4,896.7	
INPUTS (GAINS)																							
Retained Rainfall	Re	R \times RR	mm/month	91.5	91.9	106.5	162.9	197.0	196.4	226.2	233.2	187.8	176.2	146.5	120.5	91.5	91.9	106.5	162.9	197.0	196.4	1,936.7	
Applied Effluent	W	(Q \times D)/L	mm/month	200.7	181.3	200.7	194.2	200.7	194.2	200.7	200.7	194.2	200.7	194.2	200.7	200.7	181.3	200.7	194.2	200.7	194.2	2,363.3	
Inputs		Re+W	mm/month	292.2	273.2	307.2	357.2	397.7	390.7	426.9	434.0	382.0	376.9	340.8	321.2	292.2	273.2	307.2	357.2	397.7	390.7	4,300.0	
STORAGE CALCULATION (Δ)																							
Storage remaining from previous month			mm/month	0.0	0.0	0.0	0.0	0.0	22.0	68.7	168.6	269.9	254.7	155.2	0.0	0.0	0.0	0.0	0.0	0.0	22.0		
Storage for the month	S	((Re+W)-(ET+B))/V	mm/month	-365.6	-294.6	-272.9	-74.5	22.0	46.7	99.9	101.3	-15.1	-99.6	-187.1	-286.4	-365.6	-294.6	-272.9	-74.5	22.0	46.7	-1,326.0	
Cumulative Storage	M		mm	0.0	0.0	0.0	0.0	22.0	68.7	168.6	269.9	254.7	155.2	0.0	0.0	0.0	0.0	0.0	0.0	22.0	68.7		
Maximum Storage Depth for Nominated Area	N		mm	269.9																			
Maximum Storage Vol. for Nominated Area	V	N \times L	L	37,514																			
BOTTOM AREA REQUIRED FOR ZERO STORAGE				m ²	76.4	80.3	86.2	118.5	146.2	155.9	179.1	179.9	134.3	113.6	97.0	84.6	76.4	80.3	86.2	118.5	146.2	155.9	
MINIMUM BOTTOM AREA REQUIRED FOR ZERO STORAGE:				m ²	180																		

Wick trench dimensions (mm) Trench Width = **600** Depth = **450**
 Bed Width = **1,000** Depth = **150**
 Recommended wick trench length (m) = **164.2**
 Minimum trench spacing: 1m for Soil Categories 1-3; and 1.5m for Soil Categories 4-6
 No. of trenches @ (max) 20m length = **9**
 Total footprint with 1m spacing (m²) = **470**
 Total footprint with 1.5m spacing (m²) = **554**

