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City of Mountain View

COMMUNITY DEVELOPMENT DEPARTMENT
PLANNING DIVISION
500 Castro Street, P.O. Box 7540
Mountain View, CA 94039-7540
650-903-6306 | MountainView.gov

WATER BUDGET CALCULATION WORKSHEET

Project Address: _____

This worksheet is an optional element to demonstrate compliance with the City's Water Conservation in Landscaping Regulations. **If your project has elected the water budget option, please complete all sections (A, B, and C) of this worksheet**. Please refer to the Water Conservation in Landscaping Regulations for definitions of terms used in this worksheet.

SECTION A: MAXIMUM APPLIED WATER ALLOWANCE (MAWA)

Please complete the information for each hydro zone listed in Table A-1. Use as many tables as necessary to provide the square footage of landscape area per hydro zone. Information entered into this table will be used in calculations for the Maximum Applied Water Allowance (MAWA).

Table A-1: Hydro Zone Area Information

Plant Water Use Type[(a)]	Plant Type[(b)]	Hydro Zone Area *in square feet*

Summary of Hydro Zone Area Information

Summary Area		Area *in square feet*
Sum of Low-Water-Use Areas		
Sum of Moderate-Water-Use Areas		
Sum of High-Water-Use Areas		
Sum of Special Landscape Areas	*[use this value for Table A-2]*	
Sum of all Landscape Areas	*[use this value for Table A-2]*	

(a) Plant Water Use Type
HW = High-Water-Use Plants
MW = Moderate-Water-Use Plants (includes mixed moderate-low plants)
LW = Low-Water-Use Plants (includes very low-water-use plants)
SLA = Special Landscape Area

(b) Plant Type: May include categories such as:
- Native garden
- Boxwood
- Roses
- Turf
- Sports Field

SECTION A: MAXIMUM APPLIED WATER ALLOWANCE (MAWA) *(continued)*

The project's Maximum Applied Water Allowance shall be calculated using the following equation:

$$MAWA = (43)\ (0.62)\ [(0.7 \times LA) + (0.3 \times SLA)]$$

Where:

MAWA = Maximum Applied Water Allowance (gallons per year)
43 = Reference Evapotranspiration (ETo) for the City of Mountain View (inches per year)
0.62 = Conversion Factor (to gallons per square foot)
0.7 = ET Adjustment Factor (ETAF)
LA = Landscaped Area (includes Special Landscape Area; in square feet)
0.3 = The Additional ET Adjustment Factor for Special Landscape Area (1.0 - 0.7 = 0.3)
SLA = Portion of the Landscape Area Identified as Special Landscape Area (square feet)

Use Table A-2 below to identify the input values for the MAWA calculation.

Table A-2: Input Values for the MAWA Calculation

ETo *inches*	Conversion Factor	Landscape Area (LA) *square feet*	Special Landscape Area (SLA) *square feet*
43	0.62		

Show calculations for the Maximum Applied Water Allowance.

MAWA = (43) (0.62) [(0.7 x *LA*) + (0.3 x *SLA*)]

Maximum Applied Water Allowance = _____ gallons per year.

SECTION B: ESTIMATED TOTAL WATER USE (ETWU)

Please complete the plant factor and irrigation system information for your landscape. Use as many tables as necessary. Information entered into the tables below will be used for Estimated Total Water Use (ETWU) calculations.

Table B-1: Plant Factor and Irrigation System Information

	Plant Water Use Type[a]	Plant Type[b]	Plant Factor (PF) [c]	Hydro Zone Area (HA) *square feet*	Irrigation Method[d]	Irrigation Efficiency (IE)[e] *[minimum average of 70%]*
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
SLA	SLA		1.0			

(a) Plant Water Use Type
Plant water use types shall be obtained from the species evaluation list in WUCOLS (Region 1)
HW = High-Water-Use Plants
MW = Moderate-Water-Use Plants (includes mixed moderate-low plants)
LW = Low-Water-Use Plants (includes very low-water-use plants)
SLA = Special Landscape Area

(b) Plant Type
May include categories such as:
- Native garden
- Boxwood
- Roses
- Turf
- Sports Field

(c) Plant Factor
The following plant factors shall be used:
LW = 0.3
MW = 0.5
HW = 0.8
SLA = 1.0

(d) Irrigation Method
MS = Micro-spray
S = Spray
R = Rotor
B= Bubbler
D= Drip
O = Other (specify)

(e) Irrigation Efficiency
Below are typical irrigation efficiencies:
MS = 65%
S = 65% (for turf) or 80% (for shrubs)
R = 75%
B = 85%
D = 85%

SECTION B: ESTIMATED TOTAL WATER USE (ETWU) *(continued)*

The project's Estimated Total Water Use shall be calculated using the following equation:

Use only if the project includes a Special Landscape Area

$$ETWU = (43)(0.62)\left(\frac{PF \ x \ HA}{IE}\right) + (43)(0.62)(SLA)$$

Where:

ETWU = Estimated Total Water Use Per Year (gallons per year)
43 = Reference Evapotranspiration (ETo) for the City of Mountain View (inches per year)
0.62 = Conversion Factor (to gallons per square foot)
PF = Plant Factor
HA = Hydro Zone Area (square feet)
IE = Irrigation Efficiency (minimum 0.7)
SLA = Special Landscape Area (square feet)

Show calculations for the ETWU below (use as many pages as necessary).

$$ETWU_1 = (43)(0.62)\left(\frac{PF_1 \ x \ HA_1}{IE_1}\right) \quad =$$

$$ETWU_2 = (43)(0.62)\left(\frac{PF_2 \ x \ HA_2}{IE_2}\right) \quad =$$

$$ETWU_3 = (43)(0.62)\left(\frac{PF_3 \ x \ HA_3}{IE_3}\right) \quad =$$

$$ETWU_{SLA} = (43)(0.62)(SLA) \quad =$$

Sum of ETWU	

Estimated Total Water Use =_____ gallons.

SECTION C: COMPARISON OF ETWU AND MAWA

Use this section to compare the calculated ETWU to the MAWA. The calculated ETWU may not exceed the calculated MAWA.

MAWA = _____ *[from Section A]*

>

ETWU = _____ *[from Section B]*

EXAMPLE WATER BUDGET CALCULATION

SECTION A: MAXIMUM APPLIED WATER ALLOWANCE (MAWA)

Table A-1: Hydro Zone Area Information

Plant Water Use Type	Plant Type	Hydro Zone Area *square feet*
LW	Native Garden	1,500
MW	Boxwood	500
MW	Roses	500
HW	Turf	1,000

Summary of Hydro Zone Area Information

Plant Water Use Type		Area *square feet*
Sum of LW Areas		1,500
Sum of MW Areas		1,000
Sum of HW Areas		1,000
Sum of Special Landscape Areas	*[use this value for Table A-2]*	0
Sum of all Landscape Areas	*[use this value for Table A-2]*	3,500

Table A-2: Input Values for the MAWA Calculation

ETo *inches*	Conversion Factor	Landscape Area (LA) *square feet*	Special Landscape Area (SLA) *square feet*
43	0.62	3,500	0

Calculations:

MAWA = (43) (0.62) [(0.7 x LA) + (0.3 x SLA)]

= (43) (0.62) [(0.7 x 3,500) + (0.3 x 0)]

= 65,317

Maximum Applied Water Allowance = 65,317 gallons per year.

SECTION B: ESTIMATED TOTAL WATER USE (ETWU)

Table B-1: Plant Factor and Irrigation System Information

	Plant Water Use Type	Plant Type	Plant Factor (PF)	Hydro Zone Area (HA) *square feet*	Irrigation Method	Irrigation Efficiency (IE) *[minimum average of 70%]*
1	LW	Native Garden	0.3	1,500	D	0.85
2	MW	Boxwood	0.5	500	S	0.80
3	MW	Roses	0.5	500	D	0.85
4	HW	Turf	0.8	1,000	S	0.65
SLA	SLA	NA	1.0	0	NA	NA

Calculations:

$$ETWU_1 = (43)(0.62)\left(\frac{PF_1 \; x \; HA_1}{IE_1}\right) \qquad ETWU_1 = (43)(0.62)\left(\frac{0.3x1{,}500}{0.85}\right) \qquad = 14{,}114$$

$$ETWU_2 = (43)(0.62)\left(\frac{PF_2 \; x \; HA_2}{IE_2}\right) \qquad ETWU_2 = (43)(0.62)\left(\frac{0.5x500}{0.80}\right) \qquad = 8{,}331$$

$$ETWU_3 = (43)(0.62)\left(\frac{PF_3 \; x \; HA_3}{IE_3}\right) \qquad ETWU_3 = (43)(0.62)\left(\frac{0.5x500}{0.85}\right) \qquad = 7{,}841$$

$$ETWU_4 = (43)(0.62)\left(\frac{PF_3 \; x \; HA_3}{IE_3}\right) \qquad ETWU_4 = (43)(0.62)\left(\frac{0.8x1{,}000}{0.65}\right) \qquad = 32{,}812$$

$$ETWU_{SLA} = (43)(0.62)(SLA) \qquad ETWU_{SLA} = (43)(0.62)(0) \qquad = 0$$

Sum of ETWU	63,098

Estimated Total Water Use = 63,098 gallons.

SECTION C: COMPARISON OF ETWU AND MAWA

MAWA = 65,317 > ETWU = 63,098