

## **Sub-Issue 4c: Methods and Issues in Estimating Landscaped Area Water Use**

### **Overview**

Landscaped area water use is specifically identified as a component of Method 2 for estimating an urban water use target. The calculation of landscaped area water use further relies on three key component methodologies that this Committee will assist the Department in developing: landscaped area, the landscape water use per unit area (based on evapotranspiration, or ET), and service area population (because the targets are defined on a per capita basis). Service area population estimation is the subject of Issue Paper 5, so this paper will discuss only the first two.

Recommendations on landscaped area water use methodology could affect two other provisions related to urban landscape water use. They are the urban water use target Method 4 and the calculation of ET for compliance year adjustments. Method 4 is to be developed separately, and compliance ET adjustments are discussed in Issue Paper 5.

### **Key paragraphs pertaining to Landscaped Area Water Use**

For the landscaped area component of target Method 2, the legislation states:

*From CWC §10608.20 (b) (2) (B)*

*For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.*

### **DWR staff understanding of the legislation**

The SBx7-7 definition of landscape area , “landscape area irrigated through dedicated or residential meters and connections”, requires agencies in measuring their landscape area to discriminate between landscape areas that meet the definition and other landscape found in CII accounts and other non residential areas. CII landscape irrigated through a dedicated meter would be included in the SBx7-7 definition of landscape area.

### **Issues to be considered**

- 1) Measurement issues in estimating the extent of landscaped area within service area include:
  - a) The legislation lists some ways to estimate landscaped area. Are these acceptable ways of estimating landscape area? Will the Department set a single standard or allow flexibility?

- b) How should suppliers distinguish irrigated from non-irrigated areas. For example, some suppliers have lands that remote sensing could indicate as irrigated but in fact are drawing from natural channels or groundwater.
- c) Can remote sensing distinguish landscape canopy from actual irrigated area? Does this distinction matter much given other estimation errors?

**Other Reference Information for Landscaped Area Water Use**

The Model Landscape Ordinance contains the following definitions and calculations:

*“Landscape area” means all the planting areas, turf areas, and water features in a landscape. “Irrigation efficiency” (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. 0.71 is the default unless demonstrated higher. “ET adjustment factor” (ETAF) means a factor of 0.7 applied to reference ET (Kc of 0.5 and IE of 0.71 = ETAF of 0.70).*

*Max Ann. Water Allowance = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]*

*Maximum Applied Water Allowance (MAWA) is in gallons per year*

*ETo = Reference Evapotranspiration (inches per year)*

*0.62 = Conversion Factor (from inches/yr to gallons/sqft/yr)*

*0.7 = ET Adjustment Factor (ETAF), includes crop coeff. and irrig. efficiency*

*LA = Landscape Area including SLA (square feet)*

*0.3 = Additional Water Allowance for SLA*

*SLA = Special Landscape Area (square feet)*

*Or, may adjust for effective precipitation, Eppt:*

*MAWA= (ETo - Eppt) (0.62) [(0.7 x LA) + (0.3 x SLA)].*

*Total Water Use calculated for all hydrozones shall not exceed MAWA.*

*ETWU= (ETo)(0.62)[( PF xHA)/IE + SLA]*

*Where:*

*ETWU = Estimated Total Water Use per year (gallons)*

*ETo = Reference Evapotranspiration (inches)*

*PF = Plant Factor from WUCOLS (see Section 491)*

*HA = Hydrozone Area [high, medium, and low water use areas] (square feet)*

*SLA = Special Landscape Area (square feet)*

*0.62 = Conversion Factor*

*IE = Irrigation Efficiency (minimum 0.71)*