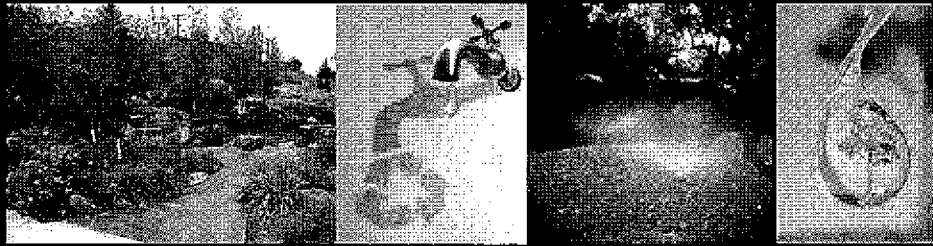


AGENDA ITEM 14: WATER EFFICIENT LANDSCAPE ORDINANCE

ATTACHMENT C

For City Council Report dated September 20, 2010

SEP 20 2010 **ITEM 14**



Water Efficient Landscapes

Guidelines for Implementing the City of Del Mar Water Efficient Landscape Ordinance

City of Del Mar, CA • September 2010

The primary purpose of these Guidelines is to provide procedural and design guidance for project applicants proposing landscape installation or rehabilitation projects that are subject to the requirements of the Water Efficient Landscape Ordinance. The general purpose of the Ordinance is to promote the design, installation, and maintenance of landscaping in a manner that conserves regional water resources by ensuring that landscaping projects are not unduly water-needy and that irrigation systems are appropriately implemented to minimize water waste.



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Water Efficient Landscapes

Guidelines for Implementing the City of Del Mar Water Efficient Landscape Ordinance

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Water Efficient Landscapes

*City of Del Mar Guidelines for Implementing the Water Efficient Landscape Ordinance
(Del Mar Municipal Code Chapter 23.60)*

1 Background, Purpose, and Applicability

In 1992, the State of California enacted the Water Conservation in Landscaping Act, (AB 325) requiring the adoption of a water efficient landscape ordinances by cities and counties throughout the state. To assist local agencies, the California Department of Water Resources (DWR) developed a Model Water Efficient Landscape Ordinance that established water efficient landscape design standards for urban landscapes. This Model Ordinance served as a template for local agencies to utilize in the development of their own local water efficient landscape ordinance. Cities could adopt the DWR model ordinance outright, modify it to meet a city's local needs, or adopt an entirely different ordinance.

In 2004, the legislature passed Assembly Bill 2717 establishing a stakeholder-based Landscape Taskforce charged with formulating recommendations to improve irrigation efficiency in new and existing landscapes and to report their findings to the governor and legislature by December 31, 2005. The report, "Water Smart Landscapes for California: AB 2717 Landscape Task Force Findings, Recommendations, & Actions," contained 43 recommendations to achieve greater landscape water use efficiency.

In 2006, Governor Schwarzenegger signed Assembly Bill 1881 (Laird, Water Conservation) amending the Water Conservation in the Landscape Act (Act). The bill requires two new things: 1) DWR is to update the original Model Water Efficient Landscape Ordinance (WELO); and 2) cities and counties are to update local Landscape Ordinances by January 1, 2010 so that they are "at least as effective as" DWR's updated Model WELO. Because of the new "at least as effective as" clause, meeting the requirements of AB 1881 resulted in significant changes to most landscape ordinances in San Diego County.

In response to the new landscape water efficiency requirements, several jurisdictions formed stakeholder groups to develop a locally-crafted Ordinance that will meet the "at least as effective as" requirement of state law, minimize the complexity and cost of compliance, and provide consistency between local jurisdictions. In the City of Del Mar, the Ad-Hoc Water Conservation Citizens Advisory Committee was formed in 2009 to advise the City on implementation policies, and recommendations for modifying the State Model to reflect conditions in the City. The Ad-Hoc Committee met with staff and presented their findings to the City Council in April 2010. In



the interim, the City's Planning and Community Development Department implemented appropriate policies to ensure that the requirements of the State Model were implemented in order to meet the January 1, 2010 deadline.

It should be noted that while the targeted deadline for DWR to release of the Model WELO was in 2008, the actual release of the Final Model was not until September 10, 2009, more than nine (9) months later than originally expected. This was due in large part to the substantial public input, and the Draft Model WELO was revised several times, making it difficult for the local agencies to craft their final versions until much later than the expected.

These Guidelines take into consideration the recommendations of the Ad-Hoc Committee, and provides the Citizens of Del Mar design guidance for projects proposing landscape installations or rehabilitations, and meets the requirements of State Law, and Del Mar Municipal Code (DMMC) Chapter 23.60.

1.1 Purpose

The primary purpose of these Guidelines is to provide procedural and design guidance for project applicants proposing landscape installation or rehabilitation projects that are subject to the requirements of the Water Efficient Landscape Ordinance. This document is also intended for use and reference by City staff in reviewing and approving designs and verifying compliance with the Water Efficient Landscape Ordinance. The general purpose of the Water Efficient Landscape Ordinance is to promote the design, installation, and maintenance of landscaping in a manner that conserves regional water resources by ensuring that landscaping projects are not unduly water-needy and that irrigation systems are appropriately implemented to minimize water waste.

Other regulations affecting landscape design and maintenance practices are potentially applicable and should be consulted for additional requirements. These regulations include but may not be limited to:

- The 2008 City of Del Mar Jurisdictional Urban Runoff Management Program;
- San Diego Regional Water Quality Control Board Order No. R9-2007-0001, the San Diego County Municipal Storm Water Permit;
- City of Del Mar Wildland/Urban Interface Fire Safety Guidelines (DMMC Section 10.04.305);
- San Diego County Fire Chiefs' Association Wildland/Urban Interface Development Standards;
- The City of Del Mar Regulations for Fuel Modification in the Landscape;
- The City of Del Mar Water Conservation and Emergency Water Management Regulations (DMMC Chapter 21.60 and 21.70);

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- The City of Del Mar Community Plan;
- The City of Del Mar Zone Code;
- The City of Del Mar Building Code;
- Specific Plans, Master Plans, General Plan, or similar land use and planning documents; and
- Conditions of approval for a specific project

It should be noted that for those properties that lie north of the San Dieguito River and Lagoon, and whose water purveyor is Santa Fe Irrigation District, different or additional regulations may apply. In such cases, please consult the Santa Fe Irrigation District for requirements.

1.2 Applicability

The Water Efficient Landscape Ordinance and these Guidelines apply to the majority of projects within the jurisdiction of the City of Del Mar, and who receive water service from the City. However, it should be noted that some properties that lie north of the San Dieguito River and Lagoon may receive water service from the Santa Fe Irrigation District. In such cases, different or additional requirements may apply to the project. If the subject property is serviced by the Santa Fe Irrigation District, the project proponent must check with that water purveyor for their specific requirements.

The Water Efficient Landscape Ordinance and these Guidelines apply to all of the following landscape projects, which lie within the City of Del Mar and for which the City is the water purveyor:

1. new landscape installation projects by individual homeowners on single-family or multi-family residential lots of two (2) units or less, and with a project landscaped area, including pools or other water features but excluding hardscape, equal to or greater than 5,000 square feet, and which require a building permit, plan check, or design review;
2. new landscape installations or landscape rehabilitation projects for multi-family residential projects of more than two (2) units, with a landscape area, including pools or other water features but excluding hardscape, equal to or greater than 2,500 square feet requiring a building permit, plan check, or design review permit;
3. new landscape installations or landscape rehabilitation projects by public agencies or private non-residential developers with a landscaped area, including pools or other water features but excluding hardscape, equal to or greater than 2,500 square feet, and which are otherwise subject to a building permit, plan check or design review permit; and

4. cemeteries. Although no cemeteries currently exist within the City, and there is little likelihood of one being established within the City, State law requires that the City's ordinance recognize the special landscape management needs of cemeteries, in the unlikely event that one is established within the jurisdiction. Therefore, the requirements for new cemeteries proposed within the City limits are limited to the provisions for Education, Economic Incentives, and Landscape Maintenance.

1.2.1 Existing Landscapes

1. Requirements for existing landscapes are limited to specific provisions regarding irrigation audits, water use analyses and water waste prevention as outlined below.
2. Any and all requirements for existing landscapes may be partially or wholly waived, at the discretion of the City or its designee, for existing landscapes that demonstrate, to the satisfaction of the Planning and Community Development Department and/or the Director of Public Works that appropriate steps have been taken by the property owner to prevent water waste and minimize water consumption on-site.

1.2.2 Landscape Rehabilitation Projects

1. To be subject to the requirements of this ordinance, the modified landscaped area in a Landscape Rehabilitation Project must be greater than 2,500 square feet and represents at least 50% of the total landscaped area.
2. The requirements of this ordinance may be partially or wholly waived, at the discretion of the Planning and Community Development Department and/or the Director of Public Works, for landscape rehabilitation projects that are limited to replacement plantings with equal or lower water needs and where the irrigation system is found to be designed, operable and/or programmed consistent with minimizing water waste in accordance with local regulations.

1.2.3 Exemptions

Pursuant to the Water Efficient Landscapes Ordinance and State law, the requirements of this ordinance do not apply to:

1. registered local, state or federal historical sites;
2. ecological restoration projects that do not require a permanent irrigation system;
3. mined-land reclamation projects that do not require a permanent irrigation system;
or
4. plant collections, as part of botanical gardens and arboretums open to the public.

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2 Submittal Requirements for New Landscape Installations or Landscape Rehabilitation Projects

For the purposes of the Water Efficient Landscape Ordinance and these Guidelines, a landscape project includes the total area of landscape in a given project and includes planting areas, turf areas, and water features but does not include:

- footprints of buildings or structures,
- sidewalks,
- driveways,
- parking lots,
- decks,
- patios,
- gravel or stone walks,
- other pervious or non-pervious hardscape, and
- other non-irrigated areas not intended for development (e.g., open spaces and existing native vegetation).

Discretionary approval is typically required for landscape projects that are subject to site plan reviews, or where a variance from a local building code is requested, or other procedural processes apply such that standard or special conditions of approval may be required by the City. Discretionary projects with conditions of approval may be approved administratively by the Director of Planning and Community Development, or acted on formally by the Design Review Board, the Planning Commission, the City Council, or other jurisdictional authority. A typical standard condition of approval reads:

“Landscaping for the project shall be designed to comply with the City’s Water Efficient Landscape Ordinance and with the Guidelines for Implementation of the Water Efficient Landscape Ordinance (DMMC Chapter 23.60).”

Landscape or water features that typically require a ministerial permit (i.e., a building, plumbing, electrical, or other similar permit), thereby triggering compliance with the Water Efficient Landscape Ordinance requirements independently of the need for discretionary approval include, but are not limited to, swimming pools, fountains or ponds, retaining walls, and overhead trellises.

2.1.1 Elements of the Landscape Documentation Package

1. A Landscape Documentation Package is required to be submitted by the project applicant for review and approval prior to the issuance of ministerial permits for landscape or water features by the City, and prior to start of construction. Unless



otherwise directed by the City, the Landscape Documentation Package must include the following elements either on plan sheets or supplemental pages:

- a. Project Information, including, but not limited to, the following:
 - ✓ date;
 - ✓ project name;
 - ✓ project address, parcel, and/or lot number(s);
 - ✓ total landscaped area (square feet) and rehabilitated landscaped area (if applicable);
 - ✓ project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed);
 - ✓ water supply type and identification of the local retail water purveyor (the City of Del Mar or Rancho Sante Fe Irrigation District);
 - ✓ checklist or index of all documents in the Landscape Documentation Package;
 - ✓ project contacts, including contact information for the project applicant and property owner;
 - ✓ a Certification of Design in accordance with **Exhibit A** of these Guidelines that includes a Landscape Professional's stamp (as applicable) signature, contact information (including email and telephone number), license number, and date, certifying the statement that "The design of this project complies with the requirements of the City's Water Efficient Landscape Ordinance;" and
 - ✓ any other information the City deems relevant for determining whether the landscape project complies with the Water Efficient Landscape Ordinance and these Guidelines.

- b. Maximum Applied Water Allowance (MAWA) and Estimated Applied Water Use (EAWU) expressed as annual totals including, but not limited to, the following:
 - ✓ a Water Efficient Landscape Worksheet for the landscape project;
 - ✓ hydrozone information table for the landscape project; and
 - ✓ water budget calculations for the landscape project.

- c. A soil management report or specifications, or specification provision requiring soil testing and amendment recommendations and implementation to be accomplished during construction of the landscape project.

- d. A landscape design plan for the landscape project.

- e. An irrigation design plan for the landscape project.

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- f. A grading design plan, unless grading information is included in the landscape design plan for the landscape project or unless the landscape project is limited to replacement planting and/or irrigation to rehabilitate an existing landscaped area.

2.1.2 Water Efficient Landscape Calculations and Alternatives

1. The project applicant shall provide the calculated Maximum Applied Water Allowance (MAWA) and Estimated Applied Water Use (EAWU) for the landscaped area as part of the Landscape Documentation Package submittal to the City.
2. The allowable EAWU for the landscaped area shall not exceed the MAWA. The MAWA shall be calculated using an evapotranspiration adjustment factor (ETAF) of 0.7 except for the portion of the MAWA applicable to any special landscaped areas within the landscape project, which shall be calculated using an ETAF of 1.0. Where the design of the landscaped area can otherwise be shown to be equivalently water-efficient, the project applicant may submit alternative or abbreviated information supporting the demonstration that the annual EAWU is less than the MAWA, at the discretion of and for the review and approval of the City.
3. Water budget calculations shall adhere to the following requirements:
 - a. The MAWA and EAWU shall be calculated using the Water Efficient Landscape Worksheets and equation presented in Appendix B.
 - b. For the calculation of the MAWA and EAWU, a project applicant shall use the Reference ETo values for the Torrey Pines Station as follows:

Period	Eto Value
January	2.2
February	2.3
March	3.4
April	3.9
May	4.0
June	4.1
July	4.6
August	4.7
September	3.8
October	2.8
November	2.0
December	2.0
Annual Eto	39.8

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Please Note: the values in this table were derived from California Irrigation Management Information System (CIMIS) and Reference Evapotranspiration Zones Map, UC Dept. of Land, Air & Water Resources and California Dept of Water Resources 1999.

- c. For calculation of the EAWU, the plant water use factor shall be determined as appropriate to the project location from the Water Use Efficiency of Landscape Species (WUCOLS) Species Evaluation List. The plant factor is 0.1 for very low water use plants, 0.2 to 0.3 for low water use plants, 0.4 to 0.6 for moderate water use plants, and 0.7 to 1.0 for high water use plants.
- d. For calculating the EAWU, the plant water use factor shall be determined for each valve hydrozone based on the highest-water-use plant species within the zone. The plant factor for each hydrozone may be required to be further refined as a "landscape coefficient," according to protocols defined in detail in the WUCOLS document, to reflect planting density and microclimate effects on water need at the option of the project applicant or the City.
- e. For calculation of the EAWU, the area of a water feature shall be defined as a high water use hydrozone with a plant factor of 1.0.
- f. For calculation of the EAWU, a temporarily irrigated hydrozone area, such as an area of highly drought-tolerant native plants that are not intended to be irrigated after they are fully established, shall be defined as a very low water use hydrozone with a plant factor of 0.1.
- g. For calculation of the MAWA, the ETAF for special landscaped areas shall be set at 1.0. For calculation of the EAWU, the ETAF for special landscaped areas shall be calculated as the special landscaped area (SLA) plant factor divided by the SLA irrigation efficiency factor.
- h. Irrigation efficiency shall be calculated using the worksheet and equation presented in Appendix B.

2.1.3 Soil Management Report

In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant, or his/her designee, as follows:

- 1. Submit soil samples to a certified agronomic soils laboratory for analysis and recommendations.
 - a. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

- b. The soil analysis may include, but is not limited to:
 - ✓ soil texture;
 - ✓ infiltration rate determined by laboratory test or soil texture infiltration rate table;
 - ✓ pH;
 - ✓ total soluble salts;
 - ✓ sodium;
 - ✓ percent organic matter; and
 - ✓ recommendations.
- 2. The project applicant, or his/her designee, shall comply with one of the following:
 - a. if significant mass grading is not planned, the soil analysis report shall be submitted to the local agency as part of the Landscape Documentation Package; or
 - b. If significant mass grading is planned, the soil analysis report shall be submitted to the City as part of the Certification of Completion.
 - c. If significant amounts of imported soils or soil amendments are recommended for the site, the soils analysis report must address this use.
 - d. The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans in order to make any necessary adjustments to the design plans.
 - e. The project applicant, or his/her designee, shall submit documentation verifying implementation of soil analysis report recommendations to the local agency with the Certification of Completion.

2.1.4 Landscape Design Plan

- 1. For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. The following design criteria shall be submitted as part of the Landscape Documentation Package:
 - a. Plant Material. Any plant may be selected for the landscaped area provided the EAWU in the landscaped area does not exceed the MAWA. To encourage the efficient use of water, the following is highly recommended:
 - i. protection and preservation of non-invasive water-conserving plant species and water-conserving turf;
 - ii. selection of water-conserving plant species and water-conserving turf;

- iii. selection of plants based on disease and pest resistance;
 - iv. selection of trees based on applicable City and local tree ordinances or tree shading guidelines; and
 - v. selection of plants from local and regional landscape program plant lists.
 - b. Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in Section 2.1.5 of these Guidelines.
 - c. Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. To encourage the efficient use of water, the following is highly recommended for inclusion in the landscape design plan:
 - i. use of the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate;
 - ii. recognition of the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, and power lines); and
 - iii. consideration of the solar orientation for plant placement to maximize summer shade and winter solar gain.
2. Turf is discouraged on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape and where 25% means 1 foot of vertical elevation change for every 4 feet of horizontal length (rise divided by run x 100 = slope percent).
3. A landscape design plan for projects in fire-prone areas and fuel modification zones shall comply with requirements of the local Fire Authority, where applicable. When conflicts between water conservation and fire safety design elements exist, the fire safety requirements shall have priority.
4. Consistent with the requirements of Section 21.60.040 of the DMMC, no more than 15 percent of the lot area of a building site shall be used for the installation and maintenance of grasses and turf. Grass and turf areas shall be separated from other vegetation so that the turf can be irrigated separately.
5. The use of invasive plant species and/or noxious plant species is strongly discouraged, and will be subject to review and approval by the City of Del Mar.

6. The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of water efficient plant species as a group.
 - a. Water Features
 - ✓ Recirculating water systems shall be used for water features.
 - ✓ Where available and consistent with public health guidelines, recycled water shall be used as a source for decorative water features.
 - ✓ The surface area of a water feature shall be included in the high water use *hydrozone* area of the water budget calculation.
 - ✓ Pool and spa covers are highly recommended.
 - b. Mulch and Amendments
 - ✓ A minimum two inch (2") layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated.
 - ✓ Stabilizing mulching products shall be used on slopes.
 - ✓ The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.
 - ✓ Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected.
7. The landscape design plan, at a minimum, shall:
 - a. delineate and label each hydrozone by number, letter, or other method;
 - b. identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscaped area shall be included in the low water use hydrozone for the water budget calculation;
 - c. identify recreational areas;
 - d. identify areas permanently and solely dedicated to edible plants;
 - e. identify areas irrigated with recycled water;
 - f. identify type of mulch and application depth;
 - g. identify soil amendments, type, and quantity;

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- h. identify type and surface area of water features;
- i. identify hardscapes (pervious and non-pervious);
- j. identify location and installation details of any applicable storm water best management practices that encourage on-site retention and infiltration of storm water consistent with the requirements of DMMC Chapter 11.30 (Stormwater Management and Discharge Control) and the City's Jurisdictional Urban Stormwater Management Plan (JURMP). Storm water best management practices are encouraged in the landscape design plan and examples include, but are not limited to:
 - ✓ infiltration beds, swales, and basins that allow water to collect and soak into the ground;
 - ✓ constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and
 - ✓ pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.
- k. identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.);
- l. contain the following statement: "I have complied with the criteria of the Water Efficient Landscape Ordinance and applied them for the efficient use of water in the landscape design plan;" and
- m. bear the signature of a Landscape Professional.

2.1.5 Irrigation Design Plan

1. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturer's recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance.
2. Consistent with the requirements of Section 21.60.040 of the DMMC, only low-volume drip or micro-irrigation systems shall be used to irrigate non-turf, outside landscaping areas. In the event that topography precludes the use of drip or micro-irrigation systems, roto-heads may be used, subject to review and approval by the City of Del Mar.
3. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

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a. System

- ✓ Dedicated landscape water meters are highly recommended on landscaped areas greater than 5,000 square feet to facilitate water management.
- ✓ Automatic irrigation controllers utilizing either evapo-transpiration or soil moisture sensor data shall be required for irrigation scheduling in all irrigation systems whenever feasible.
- ✓ The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
 - (1) If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators, booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.
 - (2) Static water pressure, dynamic or operating pressure, and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.
- ✓ Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems. Irrigation shall be avoided during windy (sustained winds of more than 10 mph), freezing weather or during rain events.
- ✓ Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required as close as possible to the point of connection of the water supply to minimize water loss in case of an emergency (such as a main line break) or routine repair.
- ✓ Consistent with the requirements of DMMC Chapter 21.20 (Water Supply - Backflow Prevention), backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system.
- ✓ High flow sensors that detect and report high flow conditions created by system damage or malfunction are recommended.
- ✓ The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.

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- ✓ Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.
- ✓ The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
- ✓ Average irrigation efficiency for the project shall be determined in accordance with the EAWU calculation sheet in Appendix B. Unless otherwise indicated by the irrigation equipment manufacturer's specifications or demonstrated by the project applicant, the irrigation efficiency of the irrigation heads used within each hydrozone shall be assumed to be:
 - (1) Pop-up stream rotator heads = 75%
 - (2) Stream rotor heads = 75%
 - (3) Microspray = 75%
 - (4) Bubbler = 80%
 - (5) Drip emitter = 85%
 - (6) Subsurface irrigation = 90%
- ✓ It is highly recommended that the project applicant inquire with the Department of Public Works about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.
- ✓ Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.
- ✓ Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.
- ✓ Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.
- ✓ Check valves or anti-drain valves are required for all irrigation systems.
- ✓ Narrow or irregularly shaped areas, including turf, less than eight (8) feet in width in any direction shall be irrigated with subsurface irrigation or a low volume overhead irrigation system.
- ✓ Overhead irrigation should be avoided within 24 inches of any non-permeable surface, and drip, drip line, or other low flow non-spray technology used within the setback area. The setback area may be planted

or unplanted. The surfacing of the setback may be mulch, gravel, or other porous material. These restrictions may be modified if:

- (1) the landscaped area is adjacent to permeable surfacing and no runoff occurs; or
- (2) the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or
- (3) the irrigation designer for the landscape project specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates strict adherence to the irrigation system design criteria found in these Guidelines. Prevention of overspray and runoff must be confirmed during an irrigation audit.
- (4) Slopes greater than 25% shall not be irrigated with an irrigation system with a precipitation rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer of the landscape project specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

b. Hydrozone

- ✓ Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.
- ✓ Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.
- ✓ Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf.
- ✓ Individual hydrozones that mix plants of moderate and low water use or moderate and high water use may be allowed if:
 - (1) the plant factor calculation is based on the proportions of the respective plant water uses and their respective plant factors; or
 - (2) the plant factor of the higher water using plant is used for the calculations.
- ✓ Individual hydrozones that mix high and low water use plants shall not be permitted.
- ✓ On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation. On the

irrigation design plan, designate the areas irrigated by each valve and assign a number to each valve.

- ✓ The irrigation design plan, at a minimum, shall contain:
 - (1) the location and size of separate water meters for landscape;
 - (2) the location, type, and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices;
 - (3) static water pressure at the point of connection to the public water supply;
 - (4) flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;
 - (5) irrigation schedule parameters necessary to program smart timers specified in the landscape design;
 - (6) the following statement: "I have complied with the criteria of the Water Efficient Landscape Ordinance and applied them accordingly for the efficient use of water in the irrigation design plan;" and
 - (7) the signature of a Landscape Professional.

2.1.6 Grading Design Plan

1. For the efficient use of water, grading of a landscape project site shall be designed to minimize soil erosion, runoff, and water waste. Finished grading configuration of the landscaped area, including pads, slopes, drainage, post-construction erosion control, and storm water control Best Management Practices, as applicable, shall be shown on the Landscape Plan unless this information is fully included in separate Grading Plans for the project, or unless the project is limited to replacement planting and/or irrigation to rehabilitate an existing landscaped area.
2. The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscaped area including:
 - a. height of graded slopes;
 - b. drainage patterns;
 - c. pad elevations;
 - d. finish grade; and

- e. storm water retention improvements, if applicable.
3. To prevent excessive erosion and runoff, it is highly recommended that the project applicant:
 - a. grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes;
 - b. avoid disruption of natural drainage patterns and undisturbed soil; and
 - c. avoid soil compaction in landscaped areas.
4. The Grading Design Plan shall contain the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of the Landscape Professional, as required by law.

2.1.7 Certification of Completion

1. Landscape project installation shall not proceed until the Landscape Documentation Package has been approved by the City and any ministerial permits required are issued.
2. The project applicant shall notify the City at the beginning of the installation work and at intervals, as necessary, for the duration of the landscape project work to schedule all required inspections.
3. Certification of Completion of the landscape project shall be obtained through a Certificate of Use and Occupancy or a Permit Final. The requirements for the Final Inspection and Permit Closure include submittal of:
 - a. A "Landscape Installation Certificate of Completion" in the form included as Appendix C of these Guidelines, which shall include:
 - ✓ certification by a Landscape Professional that the landscape project has been installed per the approved Landscape Documentation Package; and
 - ✓ the following statement: "The landscaping has been installed in substantial conformance to the design plans, and complies with the provisions of the Water Efficient Landscape Ordinance for the efficient use of water in the landscape."
 - b. Documentation of the irrigation scheduling parameters used to set the controller(s);
 - c. An irrigation audit report from a certified irrigation auditor, documentation of enrollment in regional or local water purveyor's water conservation programs, and/or documentation that the MAWA and EAWU may be required at the option of the City.

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2.1.8 Post-Installation Irrigation Scheduling

1. For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following minimum criteria:
 - a. Irrigation scheduling shall be regulated by automatic irrigation controllers.
 - b. Consistent with the recommendations found in DMMC Chapter 21.60 (Water Conservation), overhead irrigation shall be limited to between 4:00 p.m. and 9:00 a.m. There shall be no limit on times for drip or micro irrigation.
 - c. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

2.1.9 Post-Installation Landscape and Irrigation Maintenance

1. Landscapes shall be maintained to ensure water use efficiency. A proposed, regular maintenance schedule shall be submitted with the Certificate of Completion.
2. A regular maintenance schedule shall include, but not be limited to, routine inspection; adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing and obstruction to emission devices. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
3. Repair of all irrigation equipment shall be done with the originally installed components or their equivalents.
4. A project applicant is encouraged to implement sustainable or environmentally-friendly practices for overall landscape maintenance.

3 Provisions for Existing Landscapes

1. Irrigation of all landscaped areas shall be conducted in a manner conforming to the rules and requirements and shall be subject to penalties and incentives for water conservation and water waste prevention, as determined by the City.
2. Water waste resulting from inefficient landscape irrigation existing as runoff leaving the target landscape due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures is prohibited, and may be subject to enforcement pursuant to Del Mar Municipal Code Chapter 11.30 (Stormwater Management and Discharge Control). Overspray may be allowed under the following circumstances:
 - a. all reasonable attempts to minimize overspray have been implemented; and
 - b. the landscape area is adjacent to permeable surfacing and no runoff occurs; or
 - c. the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping.
3. The architectural guidelines of a common interest development, including apartments, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

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4 Irrigation Audits and Irrigation Water Use Analyses

1. The City shall administer programs that may include irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the Maximum Applied Water Allowance.
2. The City may, at its discretion, require that a project applicant, or existing property owner, conduct and submit an irrigation audit and/or irrigation water use analysis for the subject property.
3. The required irrigation audit report may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule.
4. All landscape irrigation audits shall be conducted by a certified Landscape Irrigation Auditor or other Landscape Professional.

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Appendices

Appendix A – Example Certification of Design

Appendix B – Water Efficient Landscape Worksheets

Appendix C – Example Installation Certificate of Completion

Appendix D - Definitions

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SEP 20 2010 ITEM 14



Appendix A
Example of Certification of Design

 <p>CLEAN WATER PROGRAM</p>	<h1 style="margin: 0;">CITY OF DEL MAR</h1> <p style="margin: 0;">Certification of Landscape Design</p>
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Project Information		
Project Name:		
Project Address:	Project APN:	
Project Description: (Please provide a brief description of the work to be performed.)		
Landscape Professional's Information		
Name:	Company Name:	
Address:		
Telephone #:	Fax #:	
E-mail:	License #:	License Expiration Date:

Certification
 I hereby certify that:

1. I am a Landscape Professional, appropriately licensed in the State of California to provide landscape design services.
2. The landscape design and water use calculations for the property located at the address listed above were prepared by me or under my supervision.
3. The landscape design and water use calculations for the identified property comply with the requirements of the City of Del Mar Water Efficient Landscape Ordinance (Municipal Code Section 23.60) and the City of Del Mar Guidelines for Implementation of the City of Del Mar Water Efficient Landscape Ordinance.
4. The information I have provided in this Certificate of Landscape Design is true and correct and is hereby submitted in compliance with the City of Del Mar Guidelines for Implementation of the City of Del Mar Water Efficient Landscape Ordinance.

_____ [Landscape Professional's Name] _____ [Date]

Place Stamp Here (if applicable)

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Appendix B
Water Efficient Landscape Worksheets

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CITY OF DEL MAR
EXAMPLE WATER EFFICIENT LANDSCAPE WORKSHEET



This worksheet is filled out by the *project applicant* for each Point of Connection. Please complete all sections of the worksheet.

Point of Connection # 1

Maximum Applied Water Allowance (MAWA)

Total MAWA = (ETo x 0.7 x LA in Sq. Ft. x 0.62) + (ETo x 1.0 x SLA in Sq. Ft. x 0.62) = Gallons per year for LA+SLA

where:

MAWA = Maximum Applied Water Allowance (gallons per year)

ETo = Reference Evapotranspiration for the Torrey Pines Station as shown in the Guidelines

0.7 = Evapotranspiration Adjustment Factor (ETAF)

1.0 = ETAF for Special Landscaped Area

LA = Landscaped Area (square feet)

0.62 = Conversion factor (to gallons per square foot)

SLA = Special Landscaped Area (square feet)

Example Calculation: a hypothetical landscape project in Santa Ana, CA with an irrigated landscaped area of 40,000 square feet with 10,000 square feet of Special Landscaped Area. To calculate MAWA, the annual reference evapotranspiration value for Santa Ana is 48.2 inches as listed in the Reference Evapotranspiration Table for that area.

	ETo	ETAF	LA or SLA (ft ²)	Conversion	MAWA (Gallons Per Year)
MAWA for LA =	48.2	x 0.7	x 40,000	x 0.62	= 836,752
MAWA for SLA =	48.2	x 1.0	x 10,000	x 0.62	= 298,840
Total MAWA =			50,000		1,135,592 Gallons per year for LA+SLA

Estimated Applied Water Use (EAWU)

EAWU = ETo x KI x LA x 0.62 ÷ IE = Gallons per year

where:

$K_L = K_s \times K_d \times K_{inc}$

EAWU = Estimated Applied Water Use (gallons per year)

K_s = species factor (range = 0.1-0.9) (see WUCOLS list for values)

ETo = Reference Evapotranspiration Appendix C (inches per year)

K_d = density factor (range = 0.5-1.3) (see WUCOLS for density value ranges)

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K_{mc} = microclimate factor (range = 0.5-1.4) (see WUCOLS)

WUCOLS - www.owue.water.ca.gov/docs/wucols00.pdf

K_L = Landscape Coefficient
 LA = Landscaped Area (square feet)
 0.62 = Conversion factor (to gallons per square foot)
 IE = Irrigation Efficiency = $IME \times DU$ (See definition in Appendix E for example IE percentages)
 IME = Irrigation Management Efficiency (90%)
 DU = Distribution Uniformity of irrigation head

Example Calculation:

	ETo	KL	LA	Conversion	IE	EAWU (Gallons per year)
Special Landscaped Area	48.2	x 1.00	x 10,000	x 0.62	÷ 0.75	= 398,453
Cool Season Turf	48.2	x 1.00	x 0	x 0.62	÷ 0.71	= 0
Warm Season Turf	48.2	x 0.65	x 0	x 0.62	÷ 0.71	= 0
High Water Using Shrub	48.2	x 0.70	x 0	x 0.62	÷ 0.71	= 0
Medium Water Using Shrub	48.2	x 0.50	x 15,000	x 0.62	÷ 0.65	= 344,815
Low Water Using Shrub	48.2	x 0.30	x 25,000	x 0.62	÷ 0.75	= 298,840
Very Low Water Using Shrub	48.2	x 0.20	x 0	x 0.62	÷ 0.71	= 0
Other	48.2	x 0.50	x 0	x 0.62	÷ 0.71	= 0
Other	48.2	x 0.50	x 0	x 0.62	÷ 0.71	= 0
Total EAWU =			50,000			1,042,109 Gallons per year

Compare EAWU with MAWA.

The EAWU (1,042,109 gallons per year) is less than MAWA (1,135,592 gallons per year). For this example, the water budget complies with the MAWA.

List sprinkler heads, microspray, and drip emitters here along with average precipitation rate and Distribution Uniformity of Irrigation Head.

Sprinkler Head Types	Average Precipitation Rate	Distribution Uniformity of Irrigation Head
Drip		
Microspray		
Bubbler		
Low precipitation rotating nozzles		
Stream rotors		

CITY OF DEL MAR
WATER EFFICIENT LANDSCAPE WORKSHEET



This worksheet is filled out by the *project applicant* for each Point of Connection. Please complete all sections of the worksheet.

Point of Connection # _____

Maximum Applied Water Allowance (MAWA)

Total MAWA = $(ET_o \times 0.7 \times LA \text{ in Sq. Ft.} \times 0.62) + (ET_o \times 1.0 \times SLA \text{ in Sq. Ft.} \times 0.62)$ - Gallons per year for LA+SLA

where:

- MAWA = Maximum Applied Water Allowance (gallons per year)
- ET_o = Reference Evapotranspiration for the Torrey Pines Station as shown in the Guidelines
- 0.7 = Evapotranspiration Adjustment Factor (ETAF)
- 1.0 = ETAF for Special Landscaped Area
- LA = Landscaped Area (square feet)
- 0.62 = Conversion factor (to gallons per square foot)
- SLA = Special Landscaped Area (square feet)

MAWA Calculation

	ET _o	ETAF	LA or SLA (ft ²)	Conversion	MAWA (Gallons Per Year)
MAWA for LA =		x 0.7	x	x 0.62	=
MAWA for SLA =		x 1.0	x	x 0.62	=
Total MAWA =					

Estimated Applied Water Use (EAWU)

EAWU = $ET_o \times K_L \times LA \times 0.62 \div IE$ - Gallons per year

where:

- EAWU = Estimated Applied Water Use (gallons per year)
- ET_o = Reference Evapotranspiration Appendix C (inches per year)
- K_L = Landscape Coefficient
- LA = Landscaped Area (square feet)
- K_L = K_s x K_d x K_{mc}
- K_s = species factor (range = 0.1-0.9) (see WUCOLS list for values)
- K_d = density factor (range = 0.5-1.3) (see WUCOLS for density value ranges)
- K_{mc} = microclimate factor (range = 0.5-1.4) (see WUCOLS)

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0.62 = Conversion factor (to gallons per square foot) IE = Irrigation Efficiency = IME x DU (See definition in Appendix E for example IE percentages) IME = Irrigation Management Efficiency (90%) DU = Distribution Uniformity of irrigation head		WUCOLS - www.cwuc.water.ca.gov/docs/wucols00.pdf									
EAWU Calculation:											
	ETo	KL	LA	Conversion	IE	EAWU (Gallons per year)					
Special Landscaped Area	x	x	x	0.62	+	=					
Cool Season Turf	x		x	0.62	+	=					
Warm Season Turf	x		x	0.62	+	=					
High Water Using Shrub	x		x	0.62	+	=					
Medium Water Using Shrub	x		x	0.62	+	=					
Low Water Using Shrub	x		x	0.62	+	=					
Very Low Water Using Shrub	x		x	0.62	+	=					
	x		x	0.62	+	=					
	x		x	0.62	+	=					
	x		x	0.62	+	=					
Other	x		x		+						
Total EAWU =											
List sprinkler heads, microspray, and drip emitters here along with average precipitation rate and Distribution Uniformity of Irrigation Head.											
Sprinkler Head Types						Distribution Uniformity of Irrigation Head					
Drip											
Microspray											
Bubbler											
Low precipitation rotating nozzles											
Stream rotors											

Appendix C

Example Installation Certificate of Completion

		<p style="text-align: center;">CITY OF DEL MAR LANDSCAPE INSTALLATION CERTIFICATE OF COMPLETION</p>	
Project Information			
Project Name:		Date of Project Completion:	
Project Address:		Project APN:	
Project Description: (Please provide a brief description of the work to be performed.)			
Landscape Professional's Information			
Name:		Company Name:	
Address:			
Telephone #:		Fax #:	
E-mail:		License #:	License Expiration Date:
Certification			
I hereby certify that:			
<ol style="list-style-type: none"> 1. I am a Landscape Professional, appropriately licensed in the State of California to provide landscape design services. 2. The landscape project for the property located at the address listed above was installed by me or under my supervision. 3. The landscaping for the identified property has been installed in substantial conformance with the approved Landscape Documentation Package and complies with the requirements of the City of Del Mar Water Efficient Landscape Ordinance (Municipal Code Section 23.60) and the City of Del Mar Guidelines for Implementation of the City of Del Mar Water Efficient Landscape Ordinance for the efficient use of water in the landscape. 4. The information I have provided in this Landscape Installation Certificate of Completion is true and correct and is hereby submitted in compliance with the City of Del Mar Guidelines for Implementation of the City of Del Mar Water Efficient Landscape Ordinance. 			
_____		_____	
[Landscape Professional's Name]		[Date]	

The area below is for staff use ONLY			
Submittal Date:			
Approval Date (by the City):			

Appendix D
Definitions

The terms used in these Guidelines have the meaning set forth below:

Backflow prevention device: means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

Conversion factor: means the number that converts acre-inches per acre per year to gallons per square foot per year.

Check valve: means a valve located under a sprinkler head, or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.

Certified Landscape Irrigation Auditor: means a person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation auditor certification program and Irrigation Association's Certified Landscape Irrigation Auditor program.

Certification of Design: means the certification that must be included in the Landscape Documentation Package pursuant to Section 2.1 of these Guidelines. An copy of the Certificate of Design is included in Appendix A.

City: means the City of Del Mar or its authorized designee.

Common interest developments: means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351

Distribution Uniformity (DU): is a measure of how uniformly an irrigation head applies water to a specific target area and theoretically ranges from zero to 100 percent.

Drip irrigation: means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

Emitter: means a drip irrigation emission device that delivers water slowly from the system to the soil.

Estimated Applied Water Use (EAWU): means the annual total amount of water estimated to keep plants in a healthy state. It is based on factors such as reference evapotranspiration rate, the size of the landscaped area, plant water use factors, and the irrigation efficiency within each hydrozone.

Evapotranspiration adjustment factor (ETAF): means a factor of 0.7, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this

calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET Adjustment Factor is $(0.7) = (0.5/0.71)$. ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscapes is 0.8.

Evapotranspiration rate: means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

Flow rate: means the rate at which water flows through pipes, valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

Hardscapes: means any durable material or feature (pervious and non-pervious) installed in or around a landscaped area, such as pavements or walls. Pools and other water features are considered part of the landscaped area and not considered hardscapes for purposes of these Guidelines.

Hydrozone: means a portion of the landscaped area having plants with similar water needs and typically irrigated by one valve/controller station. A hydrozone may be irrigated or non-irrigated.

Infiltration rate: means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

Invasive plants species or noxious plant species: means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive plant species may be regulated by county agricultural agencies as noxious species.

Irrigation audit: means an in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule.

Irrigation Management Efficiency (IME): means the measurement used to calculate the irrigation efficiency of the irrigation system for a landscaped project. A 90% IME can be achieved by using evapotranspiration controllers, soil moisture sensors, and other methods that will adjust irrigation run times to meet plant water needs.

Irrigation efficiency (IE): means the measurement of the amount of water beneficially used divided by the amount of water applied to a landscaped area. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of these Guidelines is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems. The following irrigation efficiency may be obtained for the listed irrigation heads with an IME of 90%:

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- a) Pop-up stream rotator heads = 75%
- b) Stream rotor heads = 75%
- c) Microspray = 75%
- d) Bubbler = 80%
- e) Drip emitter = 85%
- f) Subsurface irrigation = 90%

Landscape coefficient (K_L): is the product of a plant factor multiplied by a density factor and a microclimate factor. The landscape coefficient is derived to estimate water loss from irrigated landscaped areas and special landscaped areas.

Landscape Documentation Package: means the package of documents that a project applicant is required to submit to the City pursuant to Section 2.1 of these Guidelines.

Landscape Installation Certificate of Completion: means the certificate that must be submitted to the City pursuant to Section 2.7 Guidelines. A copy of the Landscape Installation Certificate of Completion is included in Appendix C.

Landscape Professional: means a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape pursuant to Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the California Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the California Food and Agriculture Code.

Landscape Project: means total area of landscape in a project, as provided in the definition of landscaped area, meeting the applicability requirements this Water Efficient Landscape Ordinance.

Landscaped Area: means all the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance and Estimated Applied Water Use calculations. The landscaped area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

Lateral line: means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

Low volume irrigation: means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

Low volume: overhead irrigation means aboveground irrigation heads with an upper flow limit of 0.5 GPM.

Main line: means the pressurized pipeline that delivers water from the water source to the valve or outlet.

Maximum Applied Water Allowance (MAWA): means the upper limit of annual applied water for the established landscaped area, as specified in Section 2.2 of these Guidelines. It is based upon the area's reference evapotranspiration, the ETAF, and the size of the landscaped area. The Estimated Applied Water Use shall not exceed the Maximum Applied Water Allowance.

Microclimate: means the climate of a small, specific area that may contrast with the climate of the overall landscaped area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.

Mulch: means any organic material such as leaves, bark, straw or compost, or inorganic mineral materials such as rocks, gravel, or decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

Non-pervious or impervious: means any surface or natural material that does not allow for the passage of water through the material and into the underlying soil.

Operating pressure: means the pressure at which the parts of an irrigation system of sprinklers are designed to operate at by the manufacturer

Overspray: means the irrigation water which is delivered beyond the target area.

Person: means any natural person, firm, joint venture, joint stock company, partnership, public or private association, club, company, corporation, business trust, organization, public or private agency, government agency or institution, school district, college, university, any other user of water provided by the City or the local water purveyor, or the manager, lessee, agent, servant, officer, or employee of any of them or any other entity which is recognized by law as the subject of rights or duties.

Pervious: means any surface or material that allows the passage of water through the material and into the underlying soil.

Plant factor or plant water use factor: is a factor, when multiplied by ETo, that estimates the amount of water needed by plants. For purposes of this Water Efficient Landscape Ordinance, the plant factor range for low water use plants is 0 to 0.3; the plant factor range for moderate water use plants is 0.4 to 0.6; and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in these Guidelines are derived from the Department of Water Resources 2000 publication Water Use Classification of Landscape Species.

Precipitation rate: means the rate of application of water measured in inches per hour.

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Project applicant: means the person submitting a Landscape Documentation Package required under Section 2.1 to request a permit, plan check, or design review from the local agency. A project applicant may be the property owner or his or her designee.

Property owner or owner: means the record owner of real property as shown on the most recently issued equalized assessment roll.

Reference evapotranspiration (ET_o): means a standard measurement of environmental parameters which affect the water use of plants. ET_o is given expressed in inches per day, month, or year as represented Section 2.1.2 of these Guidelines, and is an estimate of the evapotranspiration of a large field of four to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowances.

Recycled water or reclaimed water: means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features. This water is not intended for human consumption.

Runoff: means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscaped area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.

Special Landscaped Areas (SLA): means an area of the landscape dedicated solely to edible plants such as orchards and vegetable gardens, areas irrigated with recycled water, water features using recycled water, and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.

Sprinkler head: means a device which delivers water through a nozzle.

Static water pressure: means the pipeline or municipal water supply pressure when water is not flowing.

Station: means an area served by one valve or by a set of valves that operate simultaneously.

Swing joint: means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

Turf: means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.

Valve: means a device used to control the flow of water in an irrigation system

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Water Efficient Landscape Ordinance: means Ordinance No. 2010-____, adopted by the City Council on _____, 2010, and codified in the Municipal Code in Chapter 23.60.

Water Efficient Landscape Worksheets: means the worksheets required to be completed pursuant to Section 2.2 of these Guidelines and which are included in Appendix B hereof.

Water feature: means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscaped area. Constructed wetlands used for on-site wastewater treatment, habitat protection, or storm water best management practices that are not irrigated and used solely for water treatment or storm water retention are not water features and, therefore, are not subject to the water budget calculation.

Watering window: means the time of day irrigation is allowed.

WUCOLS: means the Water Use Classification of Landscape published by the University of California Cooperative Extension, the Department of Water Resources, and the Bureau of Reclamation, 2000. www.owue.water.ca.gov/docs/wucols00