

ORDINANCE NO. 570-AC

**AN ORDINANCE OF THE CITY COUNCIL OF THE
CITY OF NEEDLES, CALIFORNIA, AMENDING THE
NEEDLES MUNICIPAL CODE WITH THE ADDITION OF
SECTION 99.11 "WATER EFFICIENT LANDSCAPING" TO
ARTICLE IX "DEVELOPMENT STANDARDS"**

WHEREAS, having a reliable water supply is essential to the vitality of Needles;
and

WHEREAS, the recent drought has emphasized the need to be prudent in the use
and conservation of water; and

WHEREAS, pursuant Governor Brown's Drought Executive Order of April 1, 2015
(EO B-29-1 5), the California Water Commission approved an update the State Model
Water Efficient Landscape Ordinance ("MWELO"); and

WHEREAS, the state requires the City to adopt MWELO or an ordinance that
is at least as effective in conserving water; and

WHEREAS, the Planning Commission desires to adopt both the Water Budget
Method and an equally-effective, less expensive alternative to best serve the interests of
the community; and

WHEREAS, on November 23, 2015 the Planning Commission of the City of
Needles conducted a duly noticed public hearing concerning the above-referenced Zoning
Ordinance, and following the conclusion thereof adopted its Resolution No. 11-23-2015-1
PC, recommending that the City Council of the City of Needles adopt said amendment to
the Zoning Ordinance; and

WHEREAS, on December 8, 2015 the City Council of the City of Needles
conducted and concluded a public hearing concerning the amendment to the Needles City
Zoning Ordinance, as more fully set forth below; and

WHEREAS, all legal prerequisites to the adoption of this Ordinance have occurred;
and

WHEREAS, the City Council has considered the matter carefully,

NOW, THEREFORE, the City Council of the City of Needles does hereby find and
ordain as follows:

SECTION 1. The City Council **HEREBY FINDS AND DETERMINES** that this activity is not
subject to the California Environmental Quality Act ("CEQA") pursuant to §§15060(c)(2),
the activity will not result in a direct or reasonable foreseeable indirect physical change in
the environment.

SECTION 2. The City Council **HEREBY FINDS AND DETERMINES** that facts do exist to
approve an amendment to the Needles Municipal Code (NMC).

SECTION 3. The City Council **HEREBY APPROVES** Ordinance 570-AC, for an amendment to the Needles Municipal Code (NMC) as follows:

**SECTION 99.11
WATER EFFICIENT LANDSCAPING**

Sections

- 99.11.01 Title**
- 99.11.02 Purpose**
- 99.11.03 Applicability**
- 99.11.04 Definitions**
- 99.11.05 New Project Requirements-Streamline Process Method**
- 99.11.06 New Project Requirements – Water Budget Method**
- 99.11.07 New Project Requirements-Misc. All New Projects**
- 99.11.08 Provisions for Existing Landscapes**
- 99.11.09 Effective Precipitation**
- 99.11.10 Reporting**

99.11.01 Title. This division shall be known as the “Needles Water Efficient Landscape Ordinance,” and may be so cited.

99.11.02 Purpose. The State Legislature has found:

- (a) that the waters of the state are of limited supply and are subject to ever increasing demands;
- (b) that the continuation of California’s economic prosperity is dependent on the availability of adequate supplies of water for future uses;
- (c) that it is the policy of the State to promote the conservation and efficient use of water and to prevent the waste of this valuable resource;
- (d) that landscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development;
- (e) that landscape design, installation, maintenance and management can and should be water efficient; and
- (f) That section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not and shall not extend to waste or unreasonable method of use.

99.11.03

Applicability

- (a) Consistent with the Department of Water Resources' State Model Water Efficient Landscape Ordinance, this Ordinance shall apply to all of the following landscape projects:
1. new development projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check or design review;
 2. rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 square feet requiring a building permit, plan check, or design review;
 3. existing landscapes shall be limited to Section 99.11.08
 4. Cemeteries. Recognizing the special landscape management needs of cemeteries, new and rehabilitated cemeteries are limited to sections 99.11.06(a)(1)(b); 99.11.07(B) and (C), and existing cemeteries are limited to Section 99.11.08.
- (b) Any new project shall utilize the requirements of the Water Efficient Landscape Ordinance.
1. Projects with an aggregate landscape area less than 2,500 square feet may comply with the requirements of either the streamlined landscape method or the water budget landscape method.
 2. Projects with an aggregate landscape area in excess of 2,500 square feet shall comply with the water budget landscape method.
 3. All projects are required to comply with Section 99.11.07.
- (c) For projects using treated or untreated gray water or rainwater captured on site, any lot or parcel within the project that has less than 2500 sq. ft of landscape and meets the lot or parcel's landscape water requirement (Estimated Total Water Use) entirely with treated or untreated gray water or through stored rainwater captured on site is subject only to section 99.11.05(a)(4).
- (d) This ordinance does 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;
4. Existing plant collections, as part of botanical gardens and arboretums open to the public.

99.11.04 Definitions

The terms used in this ordinance have the meaning set forth below:

“Applied water” means the portion of water supplied by the irrigation system to the landscape.

“Automatic irrigation controller” means a timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers are able to self-adjust and schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

“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.

“Certificate of Completion” means the document required under section 99.11.030.080.

“Certified irrigation designer” means a person certified to design irrigation systems by an accredited academic institution, a professional trade organization or other program such as the US Environmental Protection Agency’s WaterSense irrigation designer certification program and Irrigation Association’s Certified Irrigation Designer program.

“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 Water Sense irrigation auditor certification program and Irrigation Association’s Certified Landscape Irrigation Auditor program.

“Check valve” or “anti-drain 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.

“Common interest developments” means community apartment projects, condominium projects, planned developments, and stock cooperatives per California Civil Code section 1351.

“Compost” means the safe and stable product of controlled biologic decomposition of organic materials that is beneficial to plant growth.

“Conversion factor (0.62)” means the number that converts acre-inches per acre per year to gallons per square foot per year.

“Distribution uniformity” means the measure of the uniformity of irrigation water over a defined area.

“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.

“Ecological restoration project” means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

“Effective precipitation” or “usable rainfall” (Eppt) means the portion of total precipitation which becomes available for plant growth.

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

“Established landscape” means the point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.

“Establishment period of the plants” means the first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth. Native habitat mitigation areas and trees may need three to five years for establishment.

“Estimated Total Water Use” (ETWU) means the total water used for the landscape as described in section 99.11.030.050.

“ET adjustment factor” (ETAF) means a factor of 0.55 for residential areas and 0.45 for non-residential areas, 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. The ETAF for new and existing (non-rehabilitated) Special Landscape Areas shall not exceed 1.0. The 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.

“Flow sensor” means an inline device installed at the supply point of the irrigation system that produces a repeatable signal proportional to flow rate. Flow sensors must be connected to an automatic irrigation controller, or flow monitor capable of receiving flow signals and operating master valves. This combination flow sensor/controller may also function as a landscape water meter or submeter.

“Friable” means a soil condition that is easily crumbled or loosely compacted down to a minimum depth per planting material requirements, whereby the root structure of newly planted material will be allowed to spread unimpeded.

“Fuel Modification Plan Guideline” means guidelines from a local fire authority to assist residents and businesses that are developing land or building structures in a fire hazard severity zone.

“Graywater” means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. “Gray water” includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers. See California Health and Safety Code section 17922.12.

“Hardscapes” means any durable material (pervious and non-pervious).

“Hydrozone” means a portion of the landscaped area having plants with similar water needs and rooting depth. 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 plant species” means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.

“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. The audit must be conducted in a manner consistent with the Irrigation Association’s Landscape Irrigation Auditor Certification program or other U.S. Environmental Protection Agency “Watersense” labeled auditing program.

“Irrigation efficiency” (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The irrigation efficiencies for purposes of this ordinance are 0.75 for overhead spray devices and 0.81 for drip systems.

“Irrigation survey” means an evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited

to: inspection, system test, and written recommendations to improve performance of the irrigation system.

“Irrigation water use analysis” means a review of water use data based on meter readings and billing data.

“Landscape architect” means a person who holds a license to practice landscape architecture in the California Business and Professions Code, section 5615.

“Landscape area” (LA) means all the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. The landscape 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).

“Landscape contractor” means a person licensed by the state of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

“Landscape Documentation Package” means the documents required under section 99.11.030.040.

“Landscape project” means total area of landscape in a project as defined in “landscape area” for the purposes of this ordinance, meeting requirements under section 99.11.010.030.

“Landscape water meter” means an inline device installed at the irrigation supply point that measures the flow of water into the irrigation system and is connected to a totalizer to record water use.

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

“Local water purveyor” means any entity, including a public agency, city, county, or private water company that provides retail water service.

“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.

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

“Master shut-off valve” is an automatic valve installed at the irrigation supply point which controls water flow into the irrigation system. When this valve is

closed water will not be supplied to the irrigation system. A master valve will greatly reduce any water loss due to a leaky station valve.

“Maximum Applied Water Allowance” (MAWA) means the upper limit of annual applied water for the established landscaped area as specified in section 14.127.030.040. It is based upon the area’s reference evapotranspiration, the ET Adjustment Factor, and the size of the landscape area. The Estimated Total Water Use shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0. $MAWA = (ET_o) (0.62) [(ETAF \times LA) + ((1 - ETAF) \times SLA)]$.

“Median” is an area between opposing lanes of traffic that may be unplanted or planted with trees, shrubs, perennials, and ornamental grasses.

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

“Mined-land reclamation projects” means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

“Mulch” means any organic material such as leaves, bark, straw, compost, or inorganic mineral materials such as rocks, gravel, and 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.

“New construction” means, for the purposes of this ordinance, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.

“Non-residential landscape” means landscapes in commercial, institutional, industrial and public settings that may have areas designated for recreation or public assembly. It also includes portions of common areas of common interest developments with designated recreational areas.

“Operating pressure” means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.

“Overhead sprinkler irrigation systems” means systems that deliver water through the air (e.g., spray heads and rotors).

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

“Permit” means an authorizing document issued by local agencies for new construction or rehabilitated landscapes.

“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, estimates the amount of water needed by plants. For purposes of this ordinance, the plant factor range for very low water use plants is 0 to 0.1, the plant factor range for low water use plants is 0.1 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 this ordinance are derived from the Department of Water Resources 2000 publication “Water Use Classification of Landscape Species.” Plant factors may also be obtained from horticultural researchers from academic institutions or professional associations as approved by the California Department of Water Resources (DWR).

“Project applicant” means the individual or entity submitting a Landscape Documentation Package required under section 99.11.030.040 to request a permit, plan check, or design review from the City of Needles. A project applicant may be the property owner or his or her designee.

“Rain sensor” or “rain sensing shutoff device” means a component which automatically suspends an irrigation event when it rains.

“Record drawing” or “as-builts” means a set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.

“Recreational area” means areas, excluding private single family residential areas designated for active play, recreation or public assembly, in parks, sports fields, picnic grounds, amphitheatres and or golf course tees, fairways, roughs, surrounds and greens.

“Recycled water,” “reclaimed water,” or “treated sewage effluent 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.

“Reference evapotranspiration” or “ETo” means a standard measurement of environmental parameters which affect the water use of plants. ETo is expressed in inches per day, month, or year as represented in Table 99.11.030.01, 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 Allowance so that regional differences in climate can be accommodated.

“Rehabilitated landscape” means any re-landscaping project that requires a permit, plan check, or design review, meets the requirements of section

99.11.010.030, and the modified landscape area is equal to or greater than 2,500 square feet.

“Residential landscape” means landscapes surrounding single or multifamily homes.

“Runoff” means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape 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.

“Soil moisture sensing device” or “soil moisture sensor” means a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

“Soil texture” means the classification of soil based on its percentage of sand, silt, and clay.

“Special Landscape Area” (SLA) means an area of the landscape dedicated solely to edible plants, recreational areas, areas irrigated with recycled water, or water features using recycled water.

“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.

“Submeter” means a metering device to measure water applied to the landscape that is installed after the primary utility water meter.

“Turf” means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermuda grass, Kikuyu grass, Seashore Paspalum, St. Augustine grass, Zoysiagrass, and Buffalo grass are warm-season grasses.

“Valve” means a device used to control the flow of water in the irrigation system.

“Water conserving plant species” means a plant species identified as having a very low or low plant factor.

“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 landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater 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 Species published by the University of California Cooperative Extension and the Department of Water Resources 2014.

99.11.05 Project Requirements - Streamlined Landscape Method - Project area must be less than 2500 square feet to qualify. Requirements will be minimal and less costly than utilization of the “Water Budget Method”, as described in Section 99.11.06. Requirements of the Streamlined Landscape Method include utilization of plants included in the “Needles Approved Water Efficient Plant list”, Exhibit “A”, as well as plants identified in the reference book “Landscape Plants for the Arizona Desert - Guide to Growing More than 200 Low-Water-Use Plants”, as well as the reference guide “Low Water-Use Plants for California and the Southwest” by Carol Shuler; installation of turf is prohibited. These projects are exempt from the requirement of having a State of California professional authorized to design a landscape or an irrigation system sign-off; as well as lower permit fees.

A. New Construction or Rehabilitated Landscapes

1. Landscape Documentation Package for the **streamlined process** to include:
 - (a) Project information, including date, project applicant, project address, total square footage of landscape area, project type (new, rehabilitated, public, private, cemetery, homeowner-installed), water supply type (potable, recycled, well); project contacts (project applicant and property owner, if applicable); statement “I agree to comply with the requirements of the Streamlined Water Efficient Landscape Project requirements”
2. Landscape Design Plan
 - (a) A landscape design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.
 1. Plant Material
 - a. Any plant from the Needles Approved Water Efficient Plant list; turf is not allowed

- b. fire-prone areas - landscape design plan shall address fire safety and prevention. A defensible space or zone around a building or structure is required per California Public Resources Code section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches.

3. Soil Preparation, Mulch and Amendments

Installation of compost at a rate of a minimum of four cubic yards per 1,000 square feet of permeable area shall be incorporated to a depth of six inches into the soil. Soils with greater than 6% organic matter in the top 6 inches of soil are exempt from adding compost and tilling.

4. Irrigation Design Plan.

This section applies to landscaped areas requiring permanent irrigation, not areas that require temporary irrigation solely for the plant establishment period. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

(a) System

1. Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data utilizing non-volatile memory shall be required for irrigation scheduling in all irrigation systems.
2. Pressure regulators shall be installed on the irrigation system to ensure the dynamic pressure of the system is within the manufacturers recommended pressure range
3. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be installed as close as possible to the point of connection of the water supply.
4. All irrigation emission devices must meet the requirements set in the American National Standards Institute (ANSI) standard, ASABE/ICC 802-2014 "Landscape Irrigation Sprinkler and Emitter Standard." All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASABE/ICC 802-2014.

2. Certificate of Completion.

At the time of final inspection, the permit applicant must provide the owner of the property with a certificate of completion, sample

attached, certificate of installation signed by building official, irrigation schedule and a schedule of landscape and irrigation maintenance.

**Figure 99.11.04(a)-1
Sample Certificate of Completion**

**CERTIFICATE OF COMPLETION
STREAMLINE PROJECT METHOD**

This certificate is filled out by the project applicant upon completion of the landscape project

PART 1. PROJECT INFORMATION SHEET

Date		
Project Name		
Name of Project Applicant		Telephone No.
		Fax No.
Title		Email Address
		Street Address
City	State	Zip Code

Project Address and Location:

Street Address		Parcel, tract or lot number, if available.
City		Latitude/Longitude (optional)
State	Zip Code	

Property Owner or his/her designee:

Name		Telephone No.
		Fax No.
Title		Email Address
Company		Street Address
City	State	Zip Code

Property Owner

"I/we certify that I/we have received copies of all the documents within the Landscape Documentation Package and the Certificate of Completion and that it is our responsibility to see that the project is maintained in accordance with the Landscape and Irrigation Maintenance Schedule."

Property Owner Signature

Date

Please answer the questions below:

- 1 Date the Landscape Documentation Package was submitted to the City _____
- 2 Date the Landscape Documentation Package was approved by the City _____
- 3 Date that a copy of the Water Efficient Landscape Worksheet (including the Water Budget Calculation) was submitted to the City _____

STREAMLINE PROJECT METHOD

This certificate is filled out by the project applicant upon completion of the landscape project

PART 2. CERTIFICATION OF INSTALLATION ACCORDING TO THE LANDSCAPE DOCUMENTATION PACKAGE

I/ we certify that based upon periodic site observations, the work has been completed in accordance with the Needles Water Efficient Landscape Ordinance and that the landscape planting and irrigation installation conform to the criteria and specifications of the approved Landscape Documentation Package”

Signature*	Date	
Name (print)	Telephone No.	
	Fax No.	
Title	Email Address	
Company	Street Address	
City	State	Zip Code

*Streamline Project Method signature to be Building Official; Budget Water Method signature to be licensed landscape professional.

PART 3. IRRIGATION SCHEDULING

Attach parameters for setting the irrigation schedule on controller .

PART 4. SCHEDULE OF LANDSCAPE AND IRRIGATION MAINTENANCE

Attach schedule of Landscape and Irrigation Maintenance .

99.11.06 Project Requirements - Water Budget Landscape Method - projects will follow guidelines of the Governor’s Executive Order EO B-29-15, requiring project plans to be designed/approved by a person authorized by the State of California to design a landscape or an irrigation system. These projects require the calculation for the Maximum Applied Water Allowance (MAWA); the development of a hydrozone table to calculate the Estimated Total Water Use (ETWU) of the proposed landscape project; including the plant factor for each plant to be used, i.e. whether a plant requires a small, moderate, or high, quantity of water for sustainability, and the assurance that the Estimated Total Water Use (ETWU) does not exceed the Maximum Applied Water Allowance (MAWA). It requires more attention to the design of the irrigation system assuming a wider range of plant factors will be part of each hydrozone.

A. New Construction or Rehabilitated Landscapes

1. Landscape Documentation Package for the **water budget landscape method** to include:
 - (a) Project information, including date, project applicant, project address, total square footage of landscape area, project type (new, rehabilitated, public, private, cemetery,

homeowner-installed), water supply type (potable, recycled, well); project contacts (project applicant and property owner, if applicable)

(b) Water Efficient Landscape Worksheet with water budget calculations.

1. A project applicant shall complete the Water Efficient Landscape Worksheet in Figure 99.11.05(b), which contains information on the plant factor (pf), irrigation method, irrigation efficiency and area associated with each hydrozone.

Calculations are then made to show that the evapotranspiration adjustment factor (ETAF) for the landscape project does not exceed a factor of 0.55 for residential areas and 0.45 for non-residential areas, exclusive of Special Landscape Areas. The ETAF for a landscape project is based on the plant factors and irrigation methods selected.

The Maximum Applied Water Allowance is calculated based on the maximum ETAF allowed (0.55 for residential areas and 0.45 for non-residential areas) and expressed as annual gallons required. The Estimated Total Water Use (ETWU) is calculated based on the plants used and irrigation method selected for the landscape design. ETWU must be below the MAWA.

In calculating the Maximum Applied Water Allowance and Estimated Total Water Use, a project applicant shall use the ETo value of 92.1, found in the Reference Evapotranspiration Table 99.11.04(b)-1

**Table 99.11.06(b)(1)
Reference Evapotranspiration (ETo) Table**

Area	Month (Inches/month)												Total (Inches/ year)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Needles	3.2	4.2	6.6	8.9	11	12.4	12.8	11	8.9	6.6	4	2.7	92.1

Figure 99.11.06(b)(2) Water Efficient Landscape Worksheet

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package.

Reference Evapotranspiration (ET_o) 92.1

Hydrozone # /Planting Description ^a	Plant Factor (PF)	Irrigation Method ^b	Irrigation Efficiency (IE) ^c	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF x Area	Estimated Total Water Use (ETWU) ^d
Regular Landscape Areas							
Totals					(A)	(B)	
Special Landscape Areas							
				1			
				1			
				1			
Totals					(C)	(D)	
ETWU Total							
Maximum Allowed Water Allowance (MAWA) ^e							

^aHydrozone #/Planting Description
E.g
1.) front lawn
2.) low water use plantings
3.) medium water use planting

^bIrrigation Method
overhead spray
or drip

^cIrrigation Efficiency
0.75 for spray head
0.81 for drip

^dETWU (Annual Gallons Required) =
ET_o x 0.62 x ETAF x Area
where 0.62 is a conversion
factor that acre-inches per
acre per year to gallons per
square foot per year.

^eMAWA (Annual Gallons Allowed) = (ET_o) (0.62) [(ETAF x LA)
+ ((1-ETAF) x SLA)]

Where 0.62 is a conversion factor that acre-inches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet, and ETAF is .55 for residential areas and 0.45 for non-residential areas

ETAF Calculations

Regular Landscape Areas

Total ETAF x Area	(B)
Total Area	(A)
Average ETAF	B ÷ A

Average ETAF for Regular Landscape Areas must be 0.55 or below for residential areas, and 0.45 or below for non-residential areas.

All Landscape Areas

Total ETAF x Area	(B+D)
Total Area	(A+C)
Sitewide ETAF	(B+D) ÷ (A+C)

2. Water budget calculations shall adhere to the following requirements:
 - a. The plant factor used shall be from WUCOLS or from horticultural researchers with academic institutions or professional associations as approved by the California Department of Water Resources (DWR). The plant factor ranges from 0 to 0.1 for very low water using plants, 0.1 to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, and from 0.7 to 1.0 for high water use plants.
 - b. All water features shall be included in the high water use hydrozone, and temporarily irrigated areas shall be included in the low water use hydrozone.
 - c. All Special Landscape Areas shall be identified and their water use calculated as shown in Figure 99.11.06(b)(2).
 - d. ETAF for new and existing (non-rehabilitated) Special Landscape Areas shall not exceed 1.0.

(c) landscape design plan

1. 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 landscape shall be included in the low water use hydrozone for the water budget calculation;
 - c. identify recreational areas (for uses other than single family residential, if any);
 - d. identify areas permanently and solely dedicated to edible plants (if any);
 - e. identify areas irrigated with recycled water (if any);

- f. identify type of mulch and application depth;
 - g. identify soil amendments, type, and quantity;
 - h. identify type and surface area of water features (if any);
 - i. identify hardscapes (pervious and non-pervious, if any);
 - j. bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape. (See 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 6 of the California Code of Regulations, and section 6721 of the California Food and Agriculture Code.)
2. A landscape design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.
- a. Plant Material
 1. Any plant may be selected for the landscape providing the Estimated Total Water Use in the landscape area does not exceed the Maximum Applied Water Allowance and the selection complies with any other adopted landscaping requirements.
 2. 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 99.11.06(A)(1)(c)(4).
 3. Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. Methods to achieve water efficiency shall include one or more of the following:
 - a. use 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;

- b. recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure [e.g., buildings, sidewalks, power lines]; allow for adequate soil volume for healthy root growth; and
 - c. consider the solar orientation for plant placement to maximize summer shade and winter solar gain.
4. Turf is not allowed 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).
 5. High water use plants, characterized by a plant factor of 0.7 to 1.0, are prohibited in street medians.
 6. A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required per California Public Resources Code section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches. Refer to the local Fuel Modification Plan guidelines.
 7. The use of invasive plant species, such as those listed by the California Invasive Plant Council, is strongly discouraged.
 8. 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 low-water use plants as a group.

b. Water Features

1. Recirculating water systems shall be used for water features.
2. Where available, recycled water shall be used as a source for decorative water features.
3. Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.
4. Pool and spa covers are highly recommended.

c. Soil Preparation, Mulch and Amendments

1. Prior to the planting of any materials, compacted soils shall be transformed to a friable condition. On engineered slopes, only amended planting holes need meet this requirement.
2. Soil amendments shall be incorporated according to recommendations of any soil report prepared and what is appropriate for the plants selected.
3. For landscape installations, compost at a rate of a minimum of four cubic yards per 1,000 square feet of permeable area shall be incorporated to a depth of six inches into the soil. Soils with greater than 6% organic matter in the top 6 inches of soil are exempt from adding compost and tilling.
4. A minimum three inch 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. To provide habitat for beneficial insects and other wildlife, up to 5 % of the landscape area may be left without mulch. Designated insect habitat must be included in the landscape design plan as such.
5. Stabilizing mulching products shall be used on slopes that meet current engineering standards.
6. The mulching portion of the seed/mulch slurry

in hydro-seeded applications shall meet the mulching requirement.

d. irrigation design plan.

1. This section applies to landscaped areas requiring permanent irrigation, not areas that require temporary irrigation solely for the plant establishment period. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturers' recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

a. The irrigation design plan, at a minimum, shall contain:

1. location and size of separate water meters for landscape;
2. 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. recycled water irrigation systems as specified in section 99.11.07(D); and
6. the signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or any other person authorized to design an irrigation system. (See 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 Agricultural Code.)

b. System

1. Landscape water meters, defined as either a dedicated water service meter or private submeter, shall be installed for all non-residential irrigated landscapes of 1,000 sq. ft. but not more than 5,000 sq.ft. (the level at which California Water Code section 535 applies) and residential irrigated landscapes of 5,000 sq. ft. or greater. A landscape water meter may be either:
 - a) a customer service meter dedicated to landscape use provided by the local water purveyor; or
 - b) a privately owned meter or submeter.
2. Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data utilizing non-volatile memory shall be required for irrigation scheduling in all irrigation systems.
3. 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, as appropriate for local climatic conditions. Irrigation should be avoided during windy or freezing weather or during rain.
3. Flow sensors that detect high flow conditions created by system damage or malfunction are required for all on non-residential landscapes and residential landscapes of 5000 sq. ft. or larger.
4. Master shut-off valves are required on all projects except landscapes that make use of technologies that allow for the individual control of sprinklers that are individually pressurized in a system equipped with low pressure shut down features.

5. 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.
6. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.
7. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
8. The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in section 99.11.06(A)(1)(b) regarding the Maximum Applied Water Allowance.
9. All irrigation emission devices must meet the requirements set in the American National Standards Institute (ANSI) standard, American Society of Agricultural and Biological Engineers'/International Code Council's (ASABE/ICC) 802-2014 "Landscape Irrigation Sprinkler and Emitter Standard." All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASABE/ICC 802-2014.
10. It is highly recommended that the project applicant or City of Needles inquire with the local water purveyor about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.
11. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.
12. Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.

13. Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.
14. Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to hardscapes or in high traffic areas of turfgrass.
15. Check valves or anti-drain valves are required on all sprinkler heads where low point drainage could occur.
16. Areas less than ten (10) feet in width in any direction shall be irrigated with subsurface irrigation or other means that produces no runoff or overspray.
17. Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. 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:
 - a. the landscape area is adjacent to permeable surfacing and no runoff occurs; or
 - b. the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or
 - c. the irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package and clearly demonstrates strict adherence to irrigation system design criteria in section 99.11.030.070 (A)(1)(f). Prevention of overspray and runoff must be confirmed during the irrigation audit.
18. Slopes greater than 25% shall not be irrigated with an irrigation system with a application rate exceeding 0.75 inches per hour. This restriction

may be modified if the landscape designer 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.

c. Hydrozone

1. Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.
2. Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.
3. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf to facilitate the appropriate irrigation of trees. The mature size and extent of the root zone shall be considered when designing irrigation for the tree.
4. Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if:
 - i. plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
 - ii. the plant factor of the higher water using plant is used for calculations.
5. Individual hydrozones that mix high and low water use plants shall not be permitted.
6. 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. Use this valve number in the Hydrozone Information Table (see Figure 99.11.06(b)(2)). This table can also assist with the irrigation audit and programming the controller.

2. Certificate of Completion.

- A. The Certificate of Completion (see Figure 99.11.030-2 for a sample certificate) shall include the following six (6) elements:
1. project information sheet that contains:
 - (a) date ;
 - (b) project name ;
 - (c) project applicant name, telephone, and mailing address;
 - (d) project address and location; and
 - (e) property owner name, telephone, and mailing address.
 2. certification by either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved Landscape Documentation Package;
 - (a) where there have been significant changes made in the field during construction, these "as-built" or record drawings shall be included with the certification;
 - (b) A diagram of the irrigation plan showing hydrozones shall be kept with the irrigation controller for subsequent management purposes.
 3. irrigation scheduling parameters used to set the controller (see section 99.11.030.090);
 4. landscape and irrigation maintenance schedule (see section 99.11.030.100); and
 5. irrigation audit report (see section 99.11.030.110).
- B. The project applicant shall:
1. submit the signed Certificate of Completion to the City Manager or his/her designee for review;
 2. ensure that copies of the approved Certificate of Completion are submitted to the local water purveyor if other than the City of Needles and property owner or his or her designee.
- C. The City Manager or his/her designee shall:
1. receive the signed Certificate of Completion from the project applicant;

2. approve or deny the Certificate of Completion. If the Certificate of Completion is denied, the City Manager or his/her designee shall provide information to the project applicant regarding reapplication, appeal, or other assistance

**Figure 99.11.030-2
Sample Certificate of Completion**

**CERTIFICATE OF COMPLETION
WATER BUDGET METHOD**

This certificate is filled out by the project applicant upon completion of the landscape project

PART 1. PROJECT INFORMATION SHEET

Date		
Project Name		
Name of Project Applicant	Telephone No.	
	Fax No.	
Title	Email Address	
Company	Street Address	
City	State	Zip Code

Project Address and Location:

Street Address		Parcel, tract or lot number, if available.
City		Latitude/Longitude (optional)
State	Zip Code	

Property Owner or his/her designee:

Name	Telephone No.	
	Fax No.	
Title	Email Address	
Company	Street Address	
City	State	Zip Code

Property Owner

"I/we certify that I/we have received copies of all the documents within the Landscape Documentation Package and the Certificate of Completion and that it is our responsibility to see that the project is maintained in accordance with the Landscape and Irrigation Maintenance Schedule."

Property Owner Signature

Date

Please answer the questions below:

- 1 Date the Landscape Documentation Package was submitted to the City _____
- 2 Date the Landscape Documentation Package was approved by the City _____
- 3 Date that a copy of the Water Efficient Landscape Worksheet (including the Water Budget Calculation) was submitted to the City _____

WATER BUDGET METHOD

This certificate is filled out by the project applicant upon completion of the landscape project

PART 2. CERTIFICATION OF INSTALLATION ACCORDING TO THE LANDSCAPE DOCUMENTATION PACKAGE

I/we certify that based upon periodic site observations, the work has been completed in accordance with the Needles Water Efficient Landscape Ordinance and that the landscape planting and irrigation installation conform to the criteria and specifications of the approved Landscape Documentation Package”

Signature*	Date	
Name (print)	Telephone No.	
	Fax No.	
Title	Email Address	
License No. or Certification No		
Company	Street Address	
City	State	Zip Code

*Signer of the landscape design plan, signer of the irrigation plan, or a licensed landscape contractor.

PART 3. IRRIGATION SCHEDULING

Attach parameters for setting the irrigation schedule on controller

PART 4. SCHEDULE OF LANDSCAPE AND IRRIGATION MAINTENANCE

Attach schedule of Landscape and Irrigation Maintenance

PART 5. LANDSCAPE IRRIGATION AUDIT REPORT

Attach Landscape Irrigation Audit Report

99.11.07 Other Project Requirements

A. Irrigation Scheduling.

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 criteria:

1. Irrigation scheduling shall be regulated by automatic irrigation controllers.
2. Overhead irrigation shall be scheduled between 8:00 p.m. and 10:00 a.m., unless weather conditions prevent it. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
3. For implementation of the irrigation schedule, particular

attention must be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the Estimated Total Water Use. Total annual applied water shall be less than or equal to Maximum Applied Water Allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data (e.g., CIMIS) or soil moisture sensor data.

4. Parameters used to set the automatic controller shall be developed and submitted for each of the following:
 - (a) the plant establishment period;
 - (b) the established landscape; and
 - (c) temporarily irrigated areas.
5. Each irrigation schedule shall consider for each station all of the following that apply:
 - (a) irrigation interval (days between irrigation);
 - (b) irrigation run times (hours or minutes per irrigation event to avoid runoff);
 - (c) number of cycle starts required for each irrigation event to avoid runoff;
 - (d) amount of applied water scheduled to be applied on a monthly basis;
 - (e) application rate setting;
 - (f) root depth setting;
 - (g) plant type setting;
 - (h) soil type;
 - (i) slope factor setting;
 - (i) shade factor setting; and
 - (j) irrigation uniformity or efficiency setting.

B. Landscape and Irrigation Maintenance Schedule.

1. Landscapes shall be maintained to ensure water use efficiency. A 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; auditing, adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; topdressing with compost, replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing obstructions 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 or with components with greater efficiency.
4. A project applicant is encouraged to implement established landscape industry sustainable Best Practices for all landscape maintenance activities.

C. Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis.

1. All landscape irrigation audits shall be conducted by a third party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person who designed the landscape or installed the landscape
2. In large projects or projects with multiple landscape installations (i.e. production home developments) an auditing rate of 1 in 7 lots or approximately 15% will satisfy this requirement.
3. For new construction and rehabilitated landscape projects installed after December 1, 2015, as described in section 99.11.03:
 - (a) the project applicant shall submit an irrigation audit report with the Certificate of Completion to the local agency that 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, including configuring irrigation controllers with application rate, soil types, plant factors, slope, exposure and any other factors necessary for accurate programming;

- (b) the City of Needles shall administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the Maximum Applied Water Allowance.

C. Irrigation Efficiency.

For the purpose of determining Estimated Total Water Use, average irrigation efficiency is assumed to be 0.75 for overhead spray devices and 0.81 for drip system devices.

D. Recycled Water.

1. The installation of recycled water irrigation systems shall allow for the current and future use of recycled water.
2. All recycled water irrigation systems shall be designed and operated in accordance with all applicable local and State laws.
3. Landscapes using recycled water are considered Special Landscape Areas. The ET Adjustment Factor for new and existing (non-rehabilitated) Special Landscape Areas shall not exceed 1.0.

E. Graywater Systems.

Graywater systems promote the efficient use of water and are encouraged to assist in on-site landscape irrigation. All graywater systems shall conform to the California Plumbing Code (Title 24, Part 5, Chapter 16) and any standards adopted by the City of Needles. Refer to section 99.11.03 for the applicability of this ordinance to landscape areas less than 2,500 square feet with the Estimated Total Water Use met entirely by graywater.

F. Stormwater Management and Rainwater Retention.

1. Stormwater management practices minimize runoff and increase infiltration which recharges groundwater and improves water quality. Implementing stormwater best management practices into the landscape and grading design plans to minimize runoff and to increase on-site

rainwater retention and infiltration are encouraged.

2. Project applicants shall refer to the local agency or Regional Water Quality Control Board for information on any applicable stormwater technical requirements.
3. All planted landscape areas are required to have friable soil to maximize water retention and infiltration. Refer to section 99.11.06(A)(2)(c)(2)(c).
4. It is strongly recommended that landscape areas be designed for capture and infiltration capacity that is sufficient to prevent runoff from impervious surfaces (i.e. roof and paved areas) from either: the one inch, 24-hour rain event or (2) the 85 percentile, 24-hour rain event, and/or additional capacity as required by any applicable local, regional, state or federal regulation.
5. It is recommended that storm water projects incorporate any of the following elements to improve on-site storm water and dry weather runoff capture and use:
 - (a) Grade impervious surfaces, such as driveways, during construction to drain to vegetated areas.
 - (b) Minimize the area of impervious surfaces such as paved areas, roof and concrete driveways.
 - (c) Incorporate pervious or porous surfaces (e.g., gravel, permeable pavers or blocks, pervious or porous concrete) that minimize runoff.
 - (d) Direct runoff from paved surfaces and roof areas into planting beds or landscaped areas to maximize site water capture and reuse.
 - (e) Incorporate rain gardens, cisterns, and other rain harvesting or catchment systems.
 - (f) Incorporate infiltration beds, swales, basins and drywells to capture storm water and dry weather runoff and increase percolation into the soil.
 - (g) Consider constructed wetlands and ponds that retain water, equalize excess flow, and filter pollutants.

2. Public Education.

1. Publications. Education is a critical component to promote the efficient use of water in landscapes. The use of appropriate principles of design, installation, management and maintenance that save water is encouraged in the community. The City of Needles shall provide information to owners of permitted renovations and new single-family residential homes regarding the design, installation, management, and maintenance of water efficient landscapes based on a water budget.
2. Model Homes. All model homes shall be landscaped and use signs and written information to demonstrate the principles of water efficient landscapes described in this ordinance.
 - a. Signs shall be used to identify the model as an example of a water efficient landscape featuring elements such as hydrozones, irrigation equipment, and others that contribute to the overall water efficient theme. Signage shall include information about the site water use; specify who designed and installed the water efficient landscape; and demonstrate low water use approaches to landscaping such as using native plants, graywater systems, and rainwater catchment systems.
 - b. Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes

H. Environmental Review.

The City of Needles must comply with the California Environmental Quality Act (CEQA), as appropriate.

Sec. 99.11.08 Provisions for Existing Landscapes

A. Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis.

1. This section, 99.11.08, shall apply to all existing landscapes that were installed before December 1, 2015 and are over one acre in size.
 - (a) For all landscapes in 99.11.08(A1) that have a water meter, the City of Needles shall administer programs that may include, but not be limited to, irrigation water use analyses, irrigation surveys, and irrigation audits to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the Maximum Applied Water Allowance for

existing landscapes. The Maximum Applied Water Allowance for existing landscapes shall be calculated as: $MAWA = (0.8) (ET_o)(LA)(0.62)$.

(b) For all landscapes in 99.11.08(A1) that do not have a meter, the City of Needles shall administer programs that may include, but not be limited to, irrigation surveys and irrigation audits to evaluate water use and provide recommendations as necessary in order to prevent water waste.

2. All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

99.11.09 Effective Precipitation.

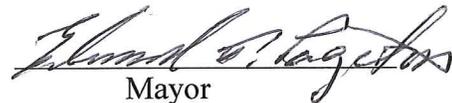
The City of Needles may consider Effective Precipitation (25% of annual precipitation) in tracking water use and may use the following equation to calculate Maximum Applied Water Allowance: $MAWA = (ET_o - Eppt) (0.62) [(0.55 \times LA) + (0.45 \times SLA)]$ for residential areas, $MAWA = (ET_o - Eppt) (0.62) [(0.45 \times LA) + (0.55 \times SLA)]$ for non-residential areas.

99.11.10 Reporting.

The City Manager or his/her designee shall report to the California Department of Water Resources by December 31, 2015, and by January 31 of each year thereafter pursuant to the requirements of California Code of Regulations Title 23, Division 2, Chapter 2.7, section 495.

INTRODUCED AND READ for the first time and ordered posted at a regular meeting of the City Council of the City of Needles, California, held on the 8th day of December, 2015, by the following roll call vote:

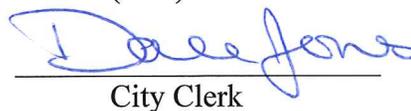
AYES: Councilmembers Gudmundson, Evans, Frazier, Darcy and
NOES: Vice Mayor Williams Richardson
ABSENT: None
ABSTAIN: None



Mayor

(Seal)

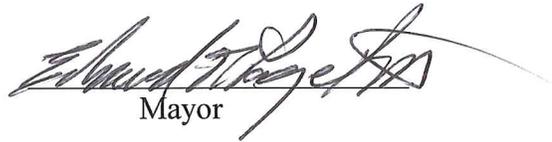
Attest:



City Clerk

PASSED, APPROVED AND ADOPTED at a regular meeting of the City Council of the City of Needles, California, held on the 12th day of January, 2016 by the following roll call vote:

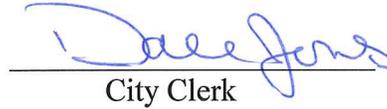
AYES: COUNCILMEMBERS GUDMUNDSON, EVANS, FRAZIER, WILLIAMS, DARCY
NOES: NONE AND RICHARDSON
ABSENT NONE
ABSTAIN NONE



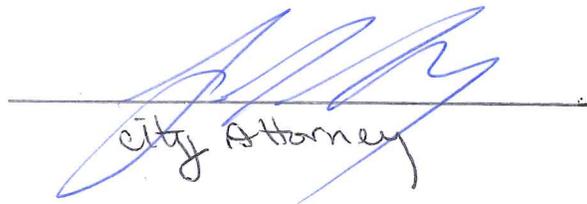
Mayor

(Seal)

Attest:



City Clerk



City Attorney

		(Needles) WUCOLS - Low Desert Region	EXHIBIT "A"	
Plant #	Type	Botanical Name	Common Name	Water Use
1	P S	Agave americana (and thick-leaved relatives)(CA native and non-native)	agave	Very Low
2	S	Ambrosia monogyra (Hymenoclea monogyra)	burrow bush	Very Low
3	Gc S N	Atriplex CA native species	saltbush	Very Low
4	Gc S N	Atriplex semibaccata	Australian saltbush	Very Low
5	Bu N	Calochortus spp.	Mariposa lily	Very Low
6	S N	Encelia californica	coast sunflower	Very Low
7	S N	Encelia farinosa	brittle bush	Very Low
8	S N	Ephedra nevadensis	Nevada ephedra	Very Low
9	S N	Eriogonum fasciculatum and cvs. (not listed above)	California buckwheat	Very Low
10	S Su	Fouquieria columnaris	boojum	Very Low
11	S Su N	Fouquieria splendens	ocotillo	Very Low
12	S N	Isocoma spp. (Haplopappus)	goldenbush	Very Low
13	S N	Justicia californica (Beloperone californica)	chuparosa	Very Low
14	S N	Larrea tridentata	creosote	Very Low
15	P Su	Mammillaria geminispina	cactus	Very Low
16	P Su	Mammillaria melanocentra	cactus	Very Low
17	S Su N	Opuntia spp. & cvs. (CA natives and non-natives)	prickly pear/cholla	Very Low
18	S Su	Pachycereus marginatus	Mexican fence post cactus	Very Low
19	P S N	Psilostrophe cooperi	paper flower	Very Low
20	S N	Psoralea argophylla (Dalea spinosa)	smoke tree	Very Low
21	S N	Senna covesii	desert senna	Very Low
22	P N	Sphaeralcea spp. (CA native and non-native spp.)	desert/globe mallow	Very Low
23	S Su	Stenocereus thurberi (Lemaireocereus)	organ pipe cactus	Very Low
25	S	Tamarix pentaphylla	tamarisk	Very Low
26	S Su N	Yucca brevifolia	Joshua tree	Very Low
27	S Su N	Yucca schidigera (Y. californica, Y. mohavensis)	Mojave yucca	Very Low
		Zinnia acerosa	desert zinnia	Low
1	Bu	Amaryllis belladonna	naked lady	Low
2	Bu	Narcissus spp.	daffodil	Low
3	Bu	Polianthes tuberosa	tuberose	Low
4	G	Pennisetum setaceum	fountain grass	Low
5	G N	Bouteloua gracilis and cvs.	blue grama	Low
6	G N	Sporobolus airoides	alkalai sacaton	Low
7	G N A	Bouteloua curtipendula	sideoats grama	Low
8	Gc	Carpobrotus spp.	ice plant (Carpobrotus)	Low
9	Gc	Dalea greggii	trailing indigo bush	Low
10	Gc	Dalea orcuttii (now Marina orcuttii)	Baja indigo bush	Low

BA-bamboo
 Bu - bult
 G - grass
 GC - groundcover
 P - perennial
 Pm - palm cycad
 S - shrub
 Su - succulent
 T - tree
 V - vine
 N - Calif. Native

(Needles) WUCOLS - Low Desert Region				
Plant #	Type	Botanical Name	Common Name	Water Use
11	Gc	Delosperma spp.	ice plant (Delosperma)	Low
12	Gc V	Antigonon leptopus	coral vine	Low
13	Gc S	Acacia redolens	prostrate acacia	Low
14	Gc S	Artemisia spp. (shrubby)	sagebrush	Low
15	Gc S N	Baccharis "Starn"	Starn coyote brush	Low
16	Gc P	Achillea millefolium (non-native hybrids)	yarrow (non-native hybrids)	Low
17	Gc P	Oenothera stubbei	Baja evening primrose	Low
18	Gc P	Zinnia grandiflora	prairie zinnia	Low
19	Gc P N	Achillea millefolium (CA native cultivars)	yarrow	Low
20	Gc P S	Santolina spp.	lavender cotton	Low
21	P	Adenium obesum	desert rose	Low
22	P	Asclepias curassavica	scarlet milkweed	Low
23	P	Berlandiera lyrata	chocolate scented daisy	Low
24	P	Dyckia spp.	dyckia	Low
25	P	Melampodium leucanthum	blackfoot daisy	Low
26	P	Poliomintha longiflora	Rosemary mint	Low
27	P	Ruellia squarrosa	water bluebell	Low
28	P	Thymophylla acerosa (Dyssodia acerosa)	shrubby dogweed	Low
29	P A	Bulbine frutescens	stalked bulbine	Low
30	P N	Argemone corymbosa	prickly poppy	Low
31	P N	Asclepias (CA native species)	milk/silk weed	Low
32	P N	Asclepias subulata	desert milkweed	Low
33	P N	Baileya multiradiata	desert marigold	Low
34	P N	Oenothera caespitosa	tufted (white) evening primrose	Low
35	P N	Oenothera californica	California evening primrose	Low
36	P N	Penstemon SW native spp. and cvs.	penstemon (SW natives)	Low
37	P N	Tetaneuris acaulis (Hymenoxys acaulis)	stemless four-nerve daisy	Low
38	P N	Thymophylla pentachaeta (Dyssodia pentachaeta)	golden fleece	Low
39	P N	Verbena gooddingii (Glandularia gooddingii)	Goodding verbena	Low
40	P Su	Echinopsis spp. (Trichocereus spp.)	torch cactus	Low
41	P Su	Euphorbia antisiphilitica	candelilla	Low
42	P Su	Euphorbia rigida	gopher spurge	Low
43	P Su	Haworthia spp.	haworthia	Low
44	P S	Agave attenuata (and thin-leaved relatives) (Ca native and non-native)	agave	Low
45	P S	Perovskia spp. & cvs.	Russian sage	Low
46	P S	Psilostrophe tagetina	paper flower	Low
47	P S	Ruellia brittoniana	Mexican petunia	Low
48	P S N	Eriogonum spp. (CA native and non-native spp.)	buckwheat	Low

BA-bamboo
 Bu - bult
 G - grass
 GC - groundcover
 P - perennial
 Pm - palm cycad
 S - shrub
 Su - succulent
 T - tree
 V - vine
 N - Calif. Native

(Needles) WUCOLS - Low Desert Region				
Plant #	Type	Botanical Name	Common Name	Water Use
49	P S N	Nolina spp. (CA natives and non-natives)	bear grass	Low
50	P S N	Romneya coulteri	Matilija poppy	Low
51	P S N	Salvia "Gayle Nielson" (also Trident as registered trademark name)	Gayle Nielson/Trident sage	Low
52	P S Su	Portulacaria afra & cvs.	elephant's food	Low
53	S	Acacia aneura	mulga	Low
54	S	Acalypha monostachya	raspberry fuzzies	Low
55	S	Aloysia macrostachya	aloyisia	Low
56	S	Aloysia triphylla	lemon verbena	Low
57	S	Ambrosia deltoidea	triangleleaf bursage	Low
58	S	Anisacanthus spp.	desert honeysuckle	Low
59	S	Artemisia filifolia	sand sagebrush	Low
60	S	Bahiopsis deltoidea (Viguiera deltoidea)	goldeneye	Low
61	S	Buddleja marrubiifolia	woolly butterfly bush	Low
62	S	Caesalpinia gilliesii	desert bird of paradise	Low
63	S	Caesalpinia mexicana	Mexican bird of paradise	Low
64	S	Caesalpinia pulcherrima (deciduous in desert)	dwarf poinciana	Low
65	S	Calliandra "Sierra Star"	fairy duster hybrid	Low
66	S	Calliandra peninsularis	Baja fairy duster	Low
67	S	Cephalocereus spp.	old man cactus	Low
68	S	Chamelaucium cvs	wax flower	Low
69	S	Chrysactinia mexicana	damianita daisy	Low
70	S	Convolvulus cneorum	bush morning glory	Low
71	S	Dalea bicolor	dalea (bicolor)	Low
72	S	Dalea frutescens	black dalea	Low
73	S	Dalea pulchra	indigo/pea bush	Low
74	S	Dalea versicolor	dalea (versicolor)	Low
75	S	Eremophila glabra	emu bush	Low
76	S	Eremophila maculata	spotted emu bush	Low
77	S	Eremophila racemosa	Easter egg bush	Low
78	S	Eremophila x "Summertime Blue"	Summertime Blue emu	Low
79	S	Espositoa lanata	Peruvian old man cactus	Low
80	S	Eucalyptus "Moon Lagoon"	fine-leafed mallee	Low
81	S	Furcraea spp.	furcraea	Low
82	S	Gossypium harknessii	otterbossie	Low
83	S	Gossypium thurberi	Thurber's cotton/desert cotton	Low
84	S	Justicia spicigera	Mexican honeysuckle	Low
85	S	Leucophyllum spp. & cvs.	purple sage, Texas ranger etc.	Low
86	S	Ruellia "Little Katie"	dwarf ruellia	Low
87	S	Ruellia californica	rama parda	Low
88	S	Ruellia peninsularis	Baja ruellia	Low

BA-bamboo
 Bu - bult
 G - grass
 GC - groundcover
 P - perennial
 Pm - palm cycad
 S - shrub
 Su - succulent
 T - tree
 V - vine
 N - Calif. Native

(Needles) WUCOLS - Low Desert Region				
Plant #	Type	Botanical Name	Common Name	Water Use
89	S	<i>Senna artemisioides</i> (<i>Cassia artemisioides</i>)	feathery cassia/senna	Low
90	S	<i>Senna bicapsularis</i> (<i>Cassia candolleana</i>)	New Zealand cassia/senna	Low
91	S	<i>Senna lindheimeriana</i> (<i>Cassia lindheimeriana</i>)	Lindheimer's senna/cassia	Low
92	S	<i>Senna nemophila</i> (<i>Cassia nemophila</i>)	desert cassia	Low
93	S	<i>Senna odorata</i> (<i>Cassia odorata</i>)	southern senna	Low
94	S	<i>Senna phyllodinea</i> (<i>Cassia phyllodinea</i>)	silver leaf cassia/senna	Low
95	S	<i>Senna sturtii</i> (<i>Cassia sturtii</i>)	Sturt's cassia/senna	Low
96	S	<i>Senna wislizeni</i> (<i>Cassia wislizeni</i>)	shrubby senna	Low
97	S	<i>Vauquelinia californica</i>	Arizona rosewood	Low
98	S	<i>Vauquelinia corymbosa</i> var. <i>heterodon</i>	narrow leaf rosewood	Low
99	S A	<i>Acacia boormanii</i>	Snowy River wattle	Low
100	S A	<i>Leucophyllum langmaniae</i> "Lynn's legacy"	Lynn's everblooming texas sage	Low
101	S A	<i>Viguiera parishii</i>	desert goldeneye	Low
102	S N	<i>Ambrosia dumosa</i>	white bursage	Low
103	S N	<i>Baccharis "Centennial"</i>	Centennial baccharis	Low
104	S N	<i>Baccharis sarothroides</i>	desert broom	Low
105	S N	<i>Calliandra californica</i>	Baja fairy duster	Low
106	S N	<i>Calliandra eriophylla</i>	fairy duster	Low
107	S N	<i>Carnegiea gigantea</i>	saguaro	Low
108	S N	<i>Chrysothamnus nauseosus</i>	rabbit brush	Low
109	S N	<i>Cleome isomeris</i>	bladder pod	Low
110	S N	<i>Cneoridium dumosum</i>	bushrue	Low
111	S N	<i>Condea emoryi</i> (<i>Hyptis emoryi</i>)	desert lavender	Low
112	S N	<i>Ericameria laricifolia</i>	turpentine bush	Low
113	S N	<i>Fallugia paradoxa</i>	Apache plume	Low
114	S N	<i>Forestiera pubescens</i>	desert olive	Low
115	S N	<i>Gutierrezia sarothrae</i>	matchweed	Low
116	S N	<i>Lycium fremontii</i>	wolfberry	Low
117	S N	<i>Pluchea sericea</i>	Coville arrow weed	Low
118	S N	<i>Rhus ovata</i>	sugar bush	Low
119	S N	<i>Salvia "Allen Chickering"</i>	Allen Chickering sage	Low
120	S N	<i>Senna armata</i> (<i>Cassia armata</i>)	spicy senna	Low
121	S N	<i>Simmondsia chinensis</i>	jojoba	Low
122	S N	<i>Trixis californica</i>	trixis	Low
123	S N A	<i>Peritoma arborea</i> (<i>Isomeris arborea</i>)	bladderpod	Low
124	S N A	<i>Salvia apiana</i>	white sage	Low
125	S N A	<i>Salvia clevelandii</i> & hybrids	salvia Cleveland/Alan Chickering etc.	Low
126	S T	<i>Acacia abyssinica</i>	Abyssinian acacia	Low
127	S T	<i>Acacia berlandieri</i>	guajillo	Low

BA-bamboo
 Bu - bult
 G - grass
 GC - groundcover
 P - perennial
 Pm - palm cycad
 S - shrub
 Su - succulent
 T - tree
 V - vine
 N - Calif. Native

(Needles) WUCOLS - Low Desert Region				
Plant #	Type	Botanical Name	Common Name	Water Use
128	S T	Acacia constricta	whitethorn acacia	Low
129	S T	Acacia craspedocarpa	leatherleaf acacia	Low
130	S T	Acacia saligna	blue leaf wattle	Low
131	S T	Cordia parvifolia	little leaf cordia	Low
132	S T	Lysiloma candida	palo blanca	Low
133	S T	Maytenus phyllanthoides	mangle dulce	Low
134	S T	Sophora secundiflora	Texas mountain laurel	Low
135	S T	Ungnadia speciosa	Mexican buckeye	Low
136	S T N	Acacia greggii	catclaw acacia	Low
137	S T N	Comarostaphylis diversifolia (Arctostaphylos diversifolia)	summer holly	Low
138	S Su	Cereus hildmannianus	night blooming cereus	Low
139	S Su	Cereus peruvianus	Peruvian apple cactus	Low
140	S Su	Euphorbia millii	crown of thorns	Low
141	S Su	Euphorbia pulcherrima	poinsettia	Low
142	S Su	Euphorbia tirucalli	milk bush	Low
143	S Su	Fouquieria macdougalii	Mexican tree ocotillo	Low
144	S Su	Hesperaloe campanulata	bell flower hesperaloe	Low
145	S Su	Hesperaloe funifera	Coahuilan hesperaloe	Low
146	S Su	Pedilanthus bracteatus	tall slipper plant	Low
147	S Su	Pedilanthus macrocarpus	slipper plant	Low
148	S Su	Yucca aloifolia	Spanish bayonet	Low
149	S Su	Yucca decipiens	palma China	Low
150	S Su	Yucca elata	soaptree yucca	Low
151	S Su	Yucca faxoniana	giant white yucca	Low
152	S Su	Yucca gloriosa	Spanish dagger	Low
153	S Su	Yucca rigida	blue yucca	Low
154	S Su	Yucca rostrata	beaked yucca	Low
155	S Su	Yucca rupicola	twisted yucca	Low
156	S Su	Yucca schottii	mountain yucca	Low
157	S Su	Yucca thompsoniana	Thompson's yucca	Low
158	S Su A	Dasyliirion spp.	desert spoon	Low
159	S Su A	Hesperaloe parviflora	red/ yellow yucca	Low
160	S Su N	Echinocactus spp. (CA native and non-native spp.)	barrel cactus	Low
161	S Su N	Ferocactus spp. (CA native and non-native spp.)	barrel cactus	Low
162	S Su N	Hesperoyucca spp. (Yucca whipplei, Yucca californica)	yucca	Low
163	S Su N	Yucca baccata	banana yucca	Low
164	S Su T N	Aloe spp. (CA native and non-native)	aloe	Low
165	Su T	Euphorbia ingens	candelabra tree	Low
166	T	Acacia pendula	weeping acacia	Low
167	T	Acacia pennatula	pennatula acacia	Low
168	T	Acacia schaffneri	twisted acacia	Low

BA-bamboo
 Bu - bult
 G - grass
 GC - groundcover
 P - perennial
 Pm - palm cycad
 S - shrub
 Su - succulent
 T - tree
 V - vine
 N - Calif. Native

(Needles) WUCOLS - Low Desert Region

Plant #	Type	Botanical Name	Common Name	Water Use
169	T	Acacia stenophylla	eumong/shoestring acacia	Low
170	T	Acacia willardiana	palo blanco	Low
171	T	Ailanthus altissima	tree of heaven	Low
172	T	Caesalpinia cacalaco	cascalote	Low
173	T	Celtis pallida	desert hackberry	Low
174	T	Ceratonia siliqua	carob	Low
175	T	Cordia boissieri	Texas olive	Low
176	T	Dalbergia sissoo	indian rosewood	Low
177	T	Ebenopsis ebano (Pithecellobium flexicaule)	Texas ebony	Low
178	T	Eucalyptus formanii	Forman's mallee	Low
179	T	Eucalyptus macrandra	long flowered marlock	Low
180	T	Eucalyptus sargentii	Salt River mallet	Low
181	T	Eucalyptus woodwardii	lemon flowered gum	Low
182	T	Eysenhardtia orthocarpa	kidneywood	Low
183	T	Gleditsia triacanthos	honey locust	Low
184	T	Havardia mexicana (Pithecellobium mexicana)	Mexican ebony	Low
185	T	Havardia pallens (Pithecellobium pallens)	tenaza	Low
186	T	Leucaena retusa	golden leadball tree	Low
187	T	Lysiloma watsonii	feather bush	Low
188	T	Melia azedarach	chinaberry	Low
189	T	Olea europaea	olive	Low
190	T	Pachycormus discolor	elephant tree	Low
191	T	Parkinsonia "Sonorae"	Sonoran palo verde	Low
192	T	Parkinsonia aculeata	Mexican palo verde/ Jerusalem thorn	Low
193	T	Parkinsonia praecox (Cercidium praecox)	palo brea tree	Low
194	T	Prosopis alba	Argentine mesquite	Low
195	T	Prosopis glandulosa (P. chilensis)	Chilean mesquite	Low
196	T	Prosopis hybrids and cvs.	prosopis hybrids	Low
197	T	Prosopis juliflora	Arizona mesquite	Low
198	T	Prosopis velutina	velvet mesquite	Low
199	T	Quercus suber	cork oak	Low
200	T	Rhus lanceolata	prairie flameleaf sumac	Low
201	T	Vachellia farnesiana (Acacia farnesiana)	sweet acacia	Low
202	T	Vachellia farnesiana var. farnesiana (Acacia farnesiana farnesiana)	desert sweet acacia	Low
203	T	Vitex agnus-castus	chaste tree	Low
204	T	X Chitalpa tashkentensis	chitalpa	Low
205	T N	Bursera microphylla	little elephant tree	Low
206	T N	Celtis reticulata	western hackberry	Low
207	T N	Hesperocyparis stephensonii (Cupressus arizonica ssp. arizonica, C. arizonica var. glabra)	Cuyamaca cypress	Low
208	T N	Olneya tesota	desert ironwood	Low

- BA-bamboo
- Bu - bult
- G - grass
- GC - groundcover
- P - perennial
- Pm - palm cycad
- S - shrub
- Su - succulent
- T - tree
- V - vine
- N - Calif. Native

(Needles) WUCOLS - Low Desert Region				
Plant #	Type	Botanical Name	Common Name	Water Use
209	T N	Parkinsonia "Desert Museum" (Cercidium)	Desert Museum palo verde	Low
210	T N	Parkinsonia florida (Cercidium florida)	blue palo verde	Low
211	T N	Parkinsonia microphylla (Cercidium microphyllum)	little leaf palo verde	Low
212	T N	Prosopis glandulosa var. torreyana	honey mesquite	Low
213	T N	Prosopis pubescens	screwbean mesquite	Low
214	V	Cissus trifoliata	treebine	Low
215	V	Macfadyena unguis-cati	cat's claw	Low

BA-bamboo
 Bu - bult
 G - grass
 GC - groundcover
 P - perennial
 Pm - palm cycad
 S - shrub
 Su - succulent
 T - tree
 V - vine
 N - Calif. Native