CITY OF BIGGS

PLANNING STAFF REPORT

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TO: Honorable Mayor and Members of the City Council

DATE: February 28, 2011

FROM: Scott Friend, AICP, City Planner

THROUGH: Pete Carr, City Administrator

SUBJECT: Adoption of a Water Efficient Landscape Ordinance pursuant to State law and the requirements of AB1881

SUMMARY

In order to comply with the requirements of Assembly Bill 1881 and the State of California's Water Conservation in Landscaping Act (AB325), the City of Biggs is required to adopt a water efficient landscape ordinance consistent with State law or to utilize the State's approved Model Ordinance. The City of Biggs has been operating under the State's model Ordinance however staff is recommending that the Council consider a local City Ordinance meeting the State's efficiency requirements in-lieu of continuing to use the State's model Ordinance. Staff has prepared a *draft* Ordinance for presentation to the City Council at this time and anticipates advertising the *draft* Ordinance for formal consideration at the March City Council meeting.

BACKGROUND / DISCUSSION

In 1992, the State of California enacted the Water Conservation in Landscaping Act (AB 325), requiring the adoption of 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. That 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 Task Force 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, the State enacted Assembly Bill 1881 requiring the DWR to update the State Model Water Efficient Landscape Ordinance. The updated model ordinance contains several landscape and irrigation design requirements aimed at reducing water waste in landscape irrigation. Further, all local land use agencies are required to adopt the model ordinance, or develop an ordinance that is at least as effective. The State's model ordinance has been slightly modified by staff to provide a more user-friendly format, to eliminate redundant and unnecessary text, to incorporate only locally significant and locally applicable information, and minor format changes so that it can be incorporated into the City of Biggs' Municipal Code. Staff is recommending to the City Council that the draft Ordinance be adopted as Chapter 12.10, Water Efficient Landscaping within title 12, Environment of the Biggs Municipal Code.

Provisions of the Water Efficient Landscape Ordinance include:

- Requires new homeowner-provided or homeowner-hired projects exceeding 5,000 square feet of irrigated area to acquire a building or landscape permit based upon a landscape plan check and approval process;
- Requires new developer-installed projects, public agency projects, and private development projects exceeding 2,500 square feet to acquire a building or landscape permit based upon a landscape plan check and approval process;
- Subjects all new landscapes to an irrigation audit, which must be performed by a certified irrigation audit inspector in accordance with the Irrigation Association Certified Landscape Irrigation Auditor Training Manual;
- Prohibits overhead irrigation within 24 inches of any non-permeable surface (driveways, public streets, sidewalks, etc., unless the landscaped area is adjacent to a permeable surface and no overspray or run-off occurs;
- Regulates existing landscapes over one-acre in size; and
- Requires the City to enforce landscape water use efficiency requirements and indentify programs that enhance and encourage landscape water use efficiency such as:
    - Tiered water rate structure;
    - Allocation-based conservation water pricing structure;
    - A rate structure at least as effective as the above options;
    - Irrigation audits and/or irrigation surveys; or
    - Penalties for water waste.

STAFF RECOMMENDATION

Staff is requesting that the City Council review the *draft* Ordinance and provide feedback and input as necessary. As noted in the introduction to this report, staff is presenting the *draft* Ordinance to the Council for initial review and consideration at this time and is anticipating advertising the Ordinance for formal consideration at the March City Council meeting.

Attachments:

- Attachment A: Draft City of Biggs Water Efficient Landscape Ordinance.

CHAPTER 12.10
WATER EFFICIENT LANDSCAPING

Sections:

12.10.010 Purpose.

A. 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. Consistent with determination, this Chapter has been created to protect local water supplies through the implementation of a program to conserve water, utilize climate-appropriate landscapes and materials, improve water quality and inform the general public of the benefits associated with the efficient use of water.

B. The purpose of this Chapter is to comply with the requirements of the California Water Conservation Landscaping Act of 2006 (AB1881), codified as Government Code Section 65591 *et. seq.*.

14.10.020 Applicability

A. This ordinance shall apply to all of the following landscape projects:

1. New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check or design review;
2. New construction and rehabilitated landscapes which are developer-installed in single-family and multifamily projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;
3. New construction landscapes which are homeowner-provided and/or homeowner-hired in single-family and multifamily residential projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building permit, plan check or design review;
4. Cemeteries.

B. 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. Plant collections, as part of botanical gardens and arboretums open to the public.

12.10.030 Definitions.

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

A. "*Applied Water*" means the portion of water supplied by the irrigation system to the landscape.

B. "*Automatic Irrigation Controller*" means an automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

C. "*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.

D. "*Certificate of Completion*" means the document required under Section 12.10.120.

E. "*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.

F. "*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.

G. "*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.

H. "*Common Interest Developments*" means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351.

I. "*Conversion Factor (0.62)*" means the number that converts acre-inches per acre per year to gallons per square foot per year.

J. "*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.

K. "*Ecological Restoration Project*" means a project where the site is intentionally altered to establish a defined, indigenous, and/or historic ecosystem.

L. "*Effective Precipitation (Eppt)*" or "Usable Rainfall" means the portion of total precipitation which becomes available for plant growth.

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

N. "*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.

O. "*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.

P. "*Estimated Total Water Use*" (ETWU) means the total water used for the landscape.

Q. "*ET 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.

R. "*Evapotranspiration Rate*" means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

S. "*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.

T. "*Hardscapes*" means any durable material (pervious and non-pervious).

U. "*Homeowner-Provided Landscaping*" means any landscaping either installed by a private individual for a single-family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for purposes of this ordinance, is a person who occupies the dwelling he or she owns. This excludes speculative homes, which are not owner-occupied dwellings.

V. "*Hydrozone*" means a portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.

W. "*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).

X. "*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.

Y. "*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.

Z. "*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 minimum average irrigation efficiency for purposes of this ordinance is 0.71. Greater irrigation efficiency can be expected from well-designed and maintained systems.

AA. "*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.

BB. "*Irrigation Water Use Analysis*" means an analysis of water use data based on meter readings and billing data.

CC. "*Landscape Architect*" means a person who holds a license to practice landscape architecture in the state of California Business and Professions Code, Section 5615.

DD. "*Landscape Area*" 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).

EE. "*Landscape Contractor*" means a person licensed by the state of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

FF. "*Landscape Documentation Package*" means the documents described by and required under Section 12.10.050.

GG. "*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 12.10.020.

HH. "*Lateral Line*" means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

II. "*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.

JJ. "*Main Line*" means the pressurized pipeline that delivers water from the water source to the valve or outlet.

KK. "*Maximum Applied Water Allowance (MAWA)*" means the upper limit of annual applied water for the established landscaped area as specified in Section 12.10.070(2). 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.

LL. "*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.

MM. "*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.

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

OO. "*New Construction*" means, for the purposes of this chapter, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.

PP. "*Noxious weeds*" means any weed designated by the Weed Control Regulations in the Weed Control Act and identified on a Regional District noxious weed control list. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.

QQ. "*Operating Pressure*" means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.

RR. "*Overhead Sprinkler Irrigation Systems*" means systems that deliver water through the air (e.g., spray heads and rotors).

SS. "*Overspray*" means the irrigation water which is delivered beyond the target area.

TT. "*Permit*" means an authorizing document issued by local agencies for new construction or rehabilitated landscapes.

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

VV. "*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 chapter, 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 this ordinance are derived from the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species".

WW. "*Precipitation Rate*" means the rate of application of water measured in inches per hour.

XX. "*Project Applicant*" means the individual or entity submitting a Landscape Documentation Package to request a permit, plan check, or design review from the City of Biggs. A project applicant may be the property owner or his or her designee.

YY. "*Rain Sensor*" or "Rain Sensing Shutoff Device" means a component which automatically suspends an irrigation event when it rains.

ZZ. "*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.

AAA. "*Recreational Area*" means areas dedicated to active play such as parks, sports fields, and golf courses where turf provides a playing surface.

BBB. "*Recycled Water*", "Reclaimed Water", or "Treated Sewage Effluent Water" means treated or recycled wastewater of a quality suitable for non-potable uses such as landscape irrigation and water features.

CCC. "*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 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.

DDD. "*Rehabilitated Landscape*" means any re-landscaping project that requires a permit, plan check, or design review, meets the requirements of Section 12.10.020, and the modified landscape area is equal to or greater than 2,500 square feet, is 50% of the total landscape area, and the modifications are completed within one year.

EEE. "*Runoff*" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape area.

FFF. "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.

GGG. "*Soil Texture*" means the classification of soil based on its percentage of sand, silt, and clay.

HHH. "*Special Landscape Area (SLA)*" means an area of the landscape dedicated solely to edible plants, 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.

III. "*Sprinkler Head*" means a device that delivers water through a nozzle.

JJJ. "*Static Water Pressure*" means the pipeline or municipal water supply pressure when water is not flowing.

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

LLL. "*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.

MMM. "*Turf*" means a ground cover surface of mowed grass.

NNN. "*Valve*" means a device used to control the flow of water in the irrigation system.

OOO. "*Water Conserving Plant Species*" means a plant species identified as having a low plant factor.

PPP. "*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.

QQQ. "Watering Window" means the time of day irrigation is allowed.

RRR. "*WUCOLS*" means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000.

12.10.040 Landscape Documentation Package Review and Approval.

Prior to construction, a complete Landscape Documentation Package (LDP) must be submitted to the City of Biggs and found to satisfy the requirements of this Chapter prior to authorization of permanent water service or the installation of a new permanent water meter:

1. The LDP submitted pursuant to this Chapter shall be routed for review to the City Planner or his/her designee to ensure compliance with this Chapter;
2. The project applicant shall be notified in writing if the LDP is found to be incomplete or inconsistent with the standards and indicate where such additions or revisions are necessary;
3. Application Fee. An application fee set by the City Council shall accompany each application submittal; and
4. Upon approval of the Landscape Documentation Package by the City of Biggs, the project applicant shall:
   a. Receive a permit or approval of the plan check or design review and record the date of the permit in the Certificate of Completion; and
   b. Submit a copy of the approved Landscape Documentation Package along with the record drawings, and any other information to the property owner or his/her designee.

12.10.050 Elements of the Landscape Documentation Package (LDP).

The Landscape Documentation Package shall include the following six (6) components:

1. Water Efficient Landscape Application (*see Section 12.10.060, Water Efficient Landscape Application Form*);
2. Water Efficient Landscape Worksheet (*see Section 12.10.070 – Water Efficient Landscape Worksheet*);
3. Soil Management Report (*see Section 12.10.080 – Soil Management Report*);
4. Landscape Design Plan (*see Section 12.10.090 – Landscape Design Plan*);
5. Irrigation Design Plan (*see Section 12.10.100 – Irrigation Design Plan*); and,
6. Grading Design Plan (*see Section 12.10.110 – Grading Design Plan*).

12.10.060 Water Efficient Landscape Application Form.

Water Efficient Landscape Application Form shall contain the following information:

1. Project information consisting of: date; project applicant; project address (including Assessor's Parcel Number(s)); total landscape area (square feet); project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed); water supply type (e.g., municipal, well, etc.); checklist of all documents in Landscape Documentation Package; project contacts to include contact information for the project applicant and property owner; and, applicant signature and date with statement, "I agree to comply with the requirements of the water efficient landscape ordinance and submit a complete Landscape Documentation Package".

12.10.070 Water Efficient Landscape Worksheet.

A project applicant shall complete the Water Efficient Landscape Worksheet containing the following information:

1. A hydrozone information table for the landscape project.
2. A water budget calculation for the landscape project adhering to the following:
   a. For the calculation of the Maximum Applied Water Allowance and Estimated Total Water Use, project applicants shall use the following Evapotranspiration (ETo) table values:

Jan	Feb	Mar	Apr	May
1.2	1.8	3.0	4.7	6.1
Jun	**Jul**	**Aug**	**Sep**	**Oct**
7.7	8.5	7.1	5.4	3.7
Nov	**Dec**	**Annual ETo**		
1.7	1.0	51.9		

b. The plant factors used shall be from Water Use Classification of Landscape Species (WUCOLS), as follows:

Low-water use plants - 0 to 0.3
Moderate-water use plants - 0.4 to 0.6
High-water use plants - 0.7 to 1.0

c. 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.
d. All Special Landscape Areas shall be identified and their water use calculated; ETAF for all Special Landscape Areas shall not exceed 1.0.

2. The Maximum Applied Water Allowance (MAWA)
a. A project's Maximum Applied Water Allowance shall be calculated using the equation:

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]
where:

MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration (inches per year)
0.62 = Conversion Factor (to gallons)
0.7 = ET Adjustment Factor (ETAF)
LA = Landscape Area including SLA (square feet)
0.3 = Additional Water Allowance for SLA
SLA = Special Landscape Area (square feet)

12.10.080 Soil Management Report.

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

A. Result of a soils analysis prepared by a qualified professional or laboratory. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

The soil analysis may include the following:

1) Determination of soil texture, including the percentage of organic matter;

2) An appropriate soil infiltration rate determined by laboratory test or soil texture infiltration rate table;

3) Measure of pH;

4) Total soluble salts and sodium; and,

5) Recommendations.

B. If significant mass grading is planned, the soil analysis report shall be submitted to the City of Biggs as part of the Certificate of Completion. If significant mass grading is not planned, the soils analysis shall be submitted as part of the Landscape Documentation Package.

C. The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.

12.10.090 Landscape Design Plan.

A. For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. 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 may be selected for the landscape, providing the Estimated Total Water Use in the landscape area does not exceed the Maximum Applied Water Allowance. To encourage the efficient use of water, the following is highly recommended:

1) Protection and preservation of native species and natural vegetation;

2) Selection of water-conserving plant and turf species; and

3) Selection of plants based on disease and pest resistance.

b. Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use.

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:

1) 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;

2) 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]; and

3) Consider the solar orientation for plant placement to maximize summer shade and winter solar gain.

d. 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 one foot of vertical elevation change for every four feet of horizontal length (rise divided by run x 100 = slope percent).

e. 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 Public Resources Code Section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches.

f. The use of invasive and/or noxious plant species is strongly discouraged.

g. 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.

2. Water Features

a. Recirculating water systems shall be used for water features.

b. Where available, recycled water shall be used as a source for decorative water features.

c. Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.

d. Pool and spa covers are highly recommended.

3. Mulch and Amendments

a. 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 not advisable.

b. Stabilizing mulching products shall be used on slopes.

c. The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.

d. Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see Section 12.10.090).

B. The landscape design plan, at a minimum, shall:

1. Delineate and label each hydrozone by number, letter, or other method;

2. 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;

3. Identify recreational areas;

4. Identify areas permanently and solely dedicated to edible plants;

5. Identify areas irrigated with recycled water, where applicable;

6. Identify type of mulch and application depth;

7. Identify soil amendments, type, and quantity;

8. Identify type and surface area of water features;

9. Identify hardscapes (pervious and non-pervious);

10. Identify location and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Stormwater best management practices are encouraged in the landscape design plan and examples include, but are not limited to:

a. Infiltration beds, swales, and basins that allow water to collect and soak into the ground;

b. Constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and

c. Pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.

11. Identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.);

12. Contain the following statement: "I have complied with the criteria of the ordinance and applied them for the efficient use of water in the landscape design plan"; and

13. Bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape.

12.10.100 Irrigation Design Plan.

A. 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.

1. System

a. Dedicated landscape water meters are highly recommended on landscape areas smaller than 5,000 square feet to facilitate water management.

b. Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data shall be required for irrigation scheduling in all irrigation systems.

c. 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.

d. Rain and freeze sensors, either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems.

e. 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.

f. Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system. Project applicants shall refer to Section 13.04.230 for additional backflow prevention requirements.

g. High flow sensors that detect and report high flow conditions created by system damage or malfunction are recommended.

h. 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.

i. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.

j. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.

k. The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in Section 12.10.070 regarding the Maximum Applied Water Allowance.

l. It is highly recommended that the project applicant inquire with the City of Biggs about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.

m. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.

n. Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.

o. Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.

p. Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.

q. Check valves or anti-drain valves are required for all irrigation systems.

r. Narrow or irregularly shaped areas, including turf, less than eight feet in width in any direction shall be irrigated with subsurface irrigation or low volume irrigation system.

s. 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:

1) The landscape 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 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 12.10.100 (A)(1)(h) of this section. Prevention of

overspray and runoff must be confirmed during the irrigation audit.

t. 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 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.

2. Hydrozone

a. Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.

b. Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.

c. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf.

d. Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if:

1) Plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or

2) The plant factor of the higher water using plant is used for calculations.

e. Individual hydrozones that mix high and low water use plants shall not be permitted.

f. On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation.

B. 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, where applicable and as specified in Section 12.10.170;

6. The following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan"; and

7. The signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or any other person authorized to design an irrigation system.

12.10.110 Grading Design Plan.

A. For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading plan shall be submitted as part of the Landscape Documentation Package.

1. The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:

a. Height of graded slopes;

b. Drainage patterns;

c. Pad elevations;

d. Finish grade; and

e. Stormwater retention improvements, if applicable.

2. To prevent excessive erosion and runoff, it is highly recommended that project applicants:

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 landscape areas.

3. 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 a licensed professional as authorized by law.

12.10.120 Certificate of Completion.

Upon completion of the installation of landscaping and irrigation systems in compliance with the approved landscape design plan, a Certificate of Completion shall be submitted to the City for review and to the owner of record. The City shall review the Certificate of Completion and shall approve or deny the Certificate. If the Certificate of Completion is denied, the City shall provide information to the project applicant regarding re-application, appeal or other assistance. The Certificate of Completion shall include the following six (6) elements:

1. Project information sheet that contains: date; project name; project applicant name, telephone, and mailing address; project address and location; and, 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. Where there have been significant changes made in the field during construction, these "as-built" or record drawings shall be included with the certification;

3. Irrigation scheduling parameters used to set the controller (see Section 12.10.130, *Irrigation Scheduling*);

4. Landscape and irrigation maintenance schedule (see Section 12.10.140, *Irrigation Maintenance Schedule*);

5. Irrigation audit report (see Section 12.10.150, *Irrigation Audit, Survey and Water Analysis*); and

6. Soil analysis report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of soil report recommendations (see Section 12.10.050, *Elements of a Landscape Documentation Package – Soil Management Report*).

12.10.130 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;
j. Shade factor setting; and
k. Irrigation uniformity or efficiency setting.

12.10.140 Landscape and Irrigation Maintenance Schedule.

Landscapes shall be maintained to ensure water use efficiency.

A. 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.

B. Repair of all irrigation equipment shall be done with the originally installed components or their equivalents.

C. A project applicant is encouraged to implement sustainable or environmentally-friendly practices for overall landscape maintenance.

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

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

B. For new construction and rehabilitated landscape projects installed after January 1, 2010:

1. The project applicant shall submit an irrigation audit report with the Certificate of Completion to the City of Biggs that may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule.

12.10.160 Irrigation Efficiency.

For the purpose of determining Maximum Applied Water Allowance, average irrigation efficiency is assumed to be 0.71. Irrigation systems shall be designed, maintained, and managed to meet or exceed an average landscape irrigation efficiency of 0.71.

12.10.170 Recycled Water.

The installation of recycled water irrigation systems shall allow for the current and future use of recycled water, unless a written exemption has been granted as described below.

A. Irrigation systems and decorative water features shall use recycled water unless a written exemption has been granted by the City stating that recycled water meeting all public health codes and standards is not available and will not be available for the foreseeable future.

B. All recycled water irrigation systems shall be designed and operated in accordance with all applicable local and State laws.

C. Landscapes using recycled water are considered Special Landscape Areas. The ET Adjustment Factor for Special Landscape Areas shall not exceed 1.0. Landscape areas which use solely reclaimed water for irrigation are exempt from the requirements of this Chapter.

14.61.180 Stormwater Management.

A. 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 retention and infiltration are encouraged.

B. Project applicants shall refer to the City of Biggs or Regional Water Quality Control Board for information on any applicable stormwater ordinances and stormwater management plans.

C. Rain gardens, cisterns, and other landscapes features and practices that increase rainwater capture and create opportunities for infiltration and/or onsite storage are recommended.

12.10.190 Public Education.

A. 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.

1. The City of Biggs shall provide information to owners of new, single-family residential homes regarding the design, installation, management, and maintenance of water efficient landscapes.

B. Model Homes. All model homes that are landscaped shall use signs and written information to demonstrate the principles of water efficient landscapes described in this ordinance.

1. 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.

2. Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes.

12.10.200 Environmental Review.

Projects subject to this Chapter shall comply with the California Environmental Quality Act (CEQA), as appropriate.

12.10.210 Provisions for Existing Landscapes.

A. This section shall apply to all existing landscapes that were installed before January 1, 2010, and are over one acre in size.

1. For all landscapes that have a water meter, the City of Biggs 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)(ETo)(LA)(0.62).

2. For all landscapes that do not have a meter, the City of Biggs 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.

3. No retrofits to irrigation systems existing prior to January 1, 2010, shall be required.

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

12.10.220 Water Waste Prevention.

A. Property owners shall prevent water waste resulting from inefficient landscape irrigation by prohibiting runoff from 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.

B. Restrictions regarding overspray and runoff may be modified if:

1. The landscape 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.

12.10.230 Effective Precipitation.

The City of Biggs 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= (ETo - Eppt) (0.62) [(0.7 x LA) + (0.3 x SLA)].

12.10.240 Exceptions

Exceptions to these Landscape Water Conservation Standards may be granted by the City of Biggs upon a finding, based on substantial evidence, that the exceptions will promote equivalent or greater water conservation than is provided for in these standards. Requests for exceptions must be accompanied by documentary evidence supporting the finding of equivalent or greater water conservation.

12.10.250 Provisions for Appeal

The applicant or affected person may appeal the final decision of staff regarding plan check or final inspection to the City Administrator by filing a written notice of appeal within ten city working days of the date of the decision to the City Planner. The decision of the City Administrator shall be final and may not be appealed to the City Council. An appeal regarding plan check must be submitted prior to the installation of the landscape or it will be deemed to have been waived.

12.10.260 Forms

The following forms shall be submitted as outlined in the Chapter:

Appendix A – Maximum Applied Water Allowance

Appendix B - Hydrozone Table

Appendix C – Certificate of Completion