Appendix I
Implementation of Programs Regarding Outdoor Watering

Discussion of Regional Landscaping Problems and Suggested Solutions

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Due to the soil conditions in this region, soil should be amended before planting landscape lawn areas. Amending the soil costs more and takes some extra work, but the benefits are many including healthier lawns and huge water savings.

The region's soil ranges from coarse decomposed granite to hard-packed clay. The coarse sandy texture of granitic soil allows water and nutrients to quickly pass downward through the soil profile resulting in wasted water and nutrients, and more frequent irrigation to maintain plant health. Through the addition of organic compost that closes up the porosity and holds moisture and nutrients in the root area, the frequency and volume of water applied can be reduced measurably.

Clay soils consist of tightly packed fine-grained particles that restrict water, air and nutrient passage. More frequent irrigation is required, since this soil type accepts only a small amount of water at a time. Runoff commonly occurs with these types of soils because many automatic irrigation time clocks only allow 3 cycles when 4 or more cycles may be needed to apply a smaller amount of water more frequently. The addition of organic compost in this case breaks up the closely packed soil particles and allows for the movement of water, air and nutrients through the soil, particularly in the root zone.

In most new developments, particularly single family dwellings, little if any good soil and/or amendments are used with the site soil. Most landscape suppliers have topsoil mixes that contain different types of compost that are added to topsoil, which make good planting mediums. Site soil can usually be amended with organics eliminating the need to bring in more soil.

Kentucky bluegrass and tall fescue are the two most predominant varieties of grass used in our region, and while some perennial rye grass and fine fescue is used, they are usually in a mix with Kentucky bluegrass. Kentucky bluegrass roots have their greatest density in the top 8 to 10 inches of soil and tall fescue roots may be found 6 to 10 feet deep. For a healthy water efficient lawn, good soil should be at least 8 to 12 inches in depth. Two inches of sand placed on top of native soil results in layering and since sand is very porous, most of the root mass will be concentrated in this layer. As the weather becomes warmer, the moisture from this top layer evaporates first and, since this is where most of the roots are concentrated (the water reservoir), the lawn is stressed and turns brown. A common response is to apply more water.

The turf industry is continually developing new grasses. Buffalo grass, Texas blue, blue gramma are just a few that are known for their low water requirements and more are being tested as this is written. Unfortunately many of these grasses will not grow well

here, some are highly allergenic, some do not offer functionality such as play and recreation areas and some just have very little aesthetic appeal. The new improved varieties of Kentucky blue grass and tall fescue are still the best type of grass for this area. Both are cool season grasses. Both have also been characterized as high water users. High waster use, however, is not inherent in the plant but is a result of a lack of education and poor water management.

Different types of grasses are discussed in the following article, *Focus on Water Management –Not the Type of Grass*, written by the author for a nursery magazine.

> Being limited to cool season grass varieties in this region is not all bad because there are a number of choices, including Kentucky bluegrass, perennial rye grass, new generation tall fescue (including dwarf fescue and fine fescue). There are also varieties of buffalo grass and other grasses being developed that will provide even more choices in the future.
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> The turf industry and end users now have turf grasses that are more drought tolerant, require less water, are more disease and pest resistant, can be mowed less frequently and very short, and use less fertilizer. These grasses also help maintain the environmental, functional and aesthetic benefits that make lawns the universally most desired component in the landscape.
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> So while trying to decide which of these grasses is the best choice, probably any of them will work, depending on the use. A lot of time can be spent discussing the hundreds of varieties and you will still come back to the same point – generally they all do the job they are supposed to do and newer varieties may give you some measure of added benefit(s).
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> Too much emphasis has been placed on the type and variety of grass, particularly when it comes to water needs. Kentucky bluegrass has had the finger pointed at it for years as being a high water user. The truth is that Kentucky bluegrass can be watered at deficit levels much lower than evapotranspiration rates and maintain vigor and functionality. With extreme cutback of irrigation it will eventually go dormant and spring back to life when water is available. The newer generation of tall fescues has been touted as being 'more' drought tolerant due to physiological mechanisms and their deep rooting. The fact is that the turf grasses we are using are very capable of using less water than we are applying – any actual high water use on lawns is the result of poor water management.
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> At a Water Symposium in Salt Lake City, Utah, the industry has been shown that while the average water requirement for lawns was 21 inches per season, people were applying in excess of 50 inches and some commercial properties were using in excess of 70 inches. This enforces the premise that most people water much more than needed. Another impact of this water abuse is runoff. A lot of the excess water ends up running off adding to non-point source pollution. After 15 years of twice a week watering and the awareness of the sensitive nature of our

water supply, our usage in this area is undoubtedly not as abusive as described in Salt Lake City, but that does not mean our water use is as efficient as it should be.

In a recent ET Controller study conducted in conjunction with the Washoe County Regional Water Planning Commission (RWPC), it was found that the irrigation efficiency of a number of systems was less than fifty percent. Sixty five percent is the minimum recommended for use in the industry. The RWPC is going to investigate increasing the sixty five percent as an important component of conservation. The RWPC is also pursuing stronger enforcement of the landscape codes.

An illustration of the amount of water that must be used to provide 12 inches of water follows:

System Efficiency	Inches of Water
50%	24
60%	20
70%	17.15
80%	15
90%	13.33

Example: If your irrigation system has an efficiency of 60%, you must apply 67% more water than needed.

Landscape professionals and homeowners need to become much more aware of good water management. Better design, installation and maintenance of irrigation systems is no longer 'sounds good' material – apathy in this area will invite more stringent restrictions of our landscapes, and not just turf areas.

In our region, irrigation schedules should be changed a minimum of six times during the irrigation season. What is evapotranspiration (ET) and how do you use it in managing landscapes? There are new irrigation clocks that can be set for the whole season, programming in all of the changes that will be necessary ahead of time. ET controllers are now available and some preliminary testing is showing substantial savings while taking the management out of the users hands – the biggest problem. Following the BMP's of landscape construction and maintenance is of great importance and are the areas of the greatest potential savings of water. Focusing on these rather than the type of grass is best.

Visit the Washoe County web site at www.washoeet.dri.edu to learn about evapotranspiration, daily rates and information about how much to water with different sprinkler heads.

The turf industry has extensive studies on every variety of turf grass known to man including how much water they require, how little water they can survive on, what nutrients they require, what soils and climates they will grow in, how much oxygen they

produce, how much carbon dioxide they remove from the atmosphere and many more things. Very little is known about woody ornamental shrubs and trees commonly used in our landscapes but there is a pervasive mentality that says its okay to have them in the landscape but look out for that high water guzzling grass.

A study conducted at the University of Nevada Las Vegas by Dr. Dale Devitt[1] concluded that the ornamental trees and shrubs (some 'native') that he used in his study will use far more water than the equivalent canopy area of tall fescue, particularly when they reach maturity. Other studies of plants commonly used in the landscape are currently being conducted and initial reports indicate the same findings as do Dr. Devitt's.

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[1]Devitt,D.A, D.S. Neuman, D.C. Bowman and R. C . Morris. 1995. Comparative water use
of turfgrass and ornamental trees in an arid environment. Journal of Turfgrass Management. 1:47-63.