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**Subject:** Comments on the 2007 Texas State Water Plan

RE: 2007 Texas State Water Plan Draft

After reviewing the State Water Plan Draft, I did not see any progressive ideas except increasing the cooperation between groundwater and surface water providers. For the most part, the draft plan was about building new lake reservoirs.

I am opposed to more reservoirs for 4 reasons. One, they are incredibly expensive to construct and maintain. Two, they destroy and or alter extensive regions of natural habitat. And three, the worst part, they evaporate enormous amounts of the rainfall they collect. It seems the only real benefit is the extra revenue brought in from recreational uses.

Lake reservoirs are not the most efficient means to store water. Look at Lake Travis that is west of Austin. This lake has a total of almost 19,000 acres. Using the annual pan evaporation of 8 inches, it can be calculated that Lake Travis loses 8,867 acre-feet per year. That translates to almost 3 billion gallons of annual water loss. In 2000, Austin used about 1 million acre-feet, so 8,867 acre-feet may seem petty, but every drop counts.

Two lake reservoirs are propose in the Panhandle. Assuming one lake has the same acreage as Lake Travis, one can assume over 11,000 acre-feet. This is because it is driier and there is less rain in the Panhandle.

The amount of water people think they can extract from the land following brush eradication pales in comparison to this 8,867 acre-feet a year. The salt cedar, which is probably the highest water using brush species uses almost 8 acre-feet of water per year. This comes to only 200 acre-feet per 25 acres.

The problem with brush clearing is that it is not predictable and can easily cause more harm than good. Also, most studies have only analyzed the immediate effects of clearing with little or no attention to the subsequent re-growth of vegetation.

When other woody plants start to grow in place of the cedar, the spring savings decrease or go away altogether. Dr. Fred Smeins, range ecologist at TAMU, once told me that even tall bunch grasse,s such as indian grass and switchgrass, would have such an effect. This is because vegetation uses water. Basically, they use it first and then we get it. What is being proposed by many is that we minimize the vegetation so that we get the water first. That fights the laws of nature and will require large amounts of taxdollars to be spent to maintain such a system.

In the Hill Country, Brad Wilcox, hydrologist with TAMU, found that significant aquifer recharge only occurs with significant rainfall events. This means that aquifer recharge is not affected by the vegetation cover. Springs and seeps on the properties of individuals can

still be managed to make them accessible and more productive. However, areas should be managed for the trees, including the cedars (Ashe junipers). It is currenly being shown by Brad Wilcox, along with Keith Owens, that deep rooted cedar trees direct stemflow of water down their trunks and into the soil at the base. They are finding that this water is then flowing past the roots faster than they can use it. This water goes down deep to the groundwater so that it is safe from surface evaporation.

The better plan would be to focus on increasing the water holding capacity and the deep infiltration of water. The soil is the best and the most economical place to store water. To do both, we must improve our soils and manage for old-growth woodlands and climax grass communities.

The Catskill Mountains provide the water for people in New York. The water is gathered in the mountains by the old-growth trees and excellent soils. The water flows down and eventually emerges in grassy meadows that further clean the water. In short, grass and trees together work to provide an excellent source of water. This is how we need to be thinking. In 1904, someone was thinking. It was William Bray with the Texas Forest Service. He viewed the Hill Country as a giant detention pond and proposed that the old-growth woodlands and forests be protected so as to protect the Hill Country's, as well as the coastal farmer's, source of water:

"On the Edwards Plateau the rock strata, exposed by erosion and dislocated by faulting, normally take up the water, which then percolates slowly to feed the steady-flowing streams. But to make this possible there must be a soil covering to hold the water when it falls. The rain comes in sudden cloudbursts, which, if not held back by forest growth, pours rapidly from the hillsides, carrying down soil and stones, and rushes off in destructive floods to inundate great areas of farm land below. Destruction of the forest cover does not take away the reservoir; it opens the gates to pour the water down in successive inundations, instead of holding it in check until it is needed."

Improving water storage capacity of the soil and enhancing deep drainage will help to raise the water table and provide a more constant flow of water in our streams. That will help people in rural areas, but what about urban areas? Most urban areas have too much impermeable surfaces, so most water just runs off into the rivers and streams.

The solution? Rainwater harvesting.

In Chapter 10 on the management strategies, rainwater harvesting was listed only once as a subcategory of conservation. Using rainwater should not be viewed as a way to conserve water. It should be be viewed as a source of water that is of equal or greater importance that both groundwaters and surface waters.

Case Study: India

Like the Hill Country, India experiences severe droughts and flash floods. The problem in areas that lack good soil infiltration (whether

due to impermeable paving, eroded and compacted soils) is the potential to recharge groundwaters is decreased dramatically. This lowers the groundwater tables for wells and causes rivers to go dry in times of drought.

Five thousand years ago, developments in northern India solved their water planning issues. The Indus Valley Civilization had one of the most sophisticated urban water supply and sewage systems in the world: rainwater harvesting. One of the oldest rainwater harvesting systems is found in the Western Ghats. Each fort in the area had its own water harvesting and storage system in the form of rock-cut cisterns, ponds, tanks and wells that are still in use today. Houses in parts of western Rajasthan were built so that each had a rooftop water harvesting system. Rainwater from these rooftops was directed into underground tanks. Even along trade routes, catchment centers were constructed to provide the weary traveller with water.

So why did they harvest the rain? Is it because they had lots of rain? No, it's because they had droughts. They saw how quickly the rivers dried up after flooding rains had fallen. They wisely realized that if this water can be held back, stored and used, it can then also seep into the ground and recharge the groundwater supply as opposed to flowing too fast to the river. Not only does this recharging arrest groundwater depletion, it also raises the declining water table and can help augment water supply.

Today, in India, rainwater harvesting has become a very popular method of conserving water especially in the urban areas. Town planners and civic authorities in many cities in India are introducing bylaws that make rainwater harvesting compulsory in all new structures. No water or sewage connection would be given if a new building did not have provisions for rainwater harvesting. Such rules should also be implemented in all the other cities to ensure a rise in the groundwater level.

All you need for a water harvesting system is rain, and a place to collect it! Typically, rain is collected on rooftops and other surfaces, and the water is carried down to where it can be used immediately or stored. You can direct water run-off from this surface to plants, trees or lawns or even to the aquifer.

Why do we feel the need to invest in macro facilities? Why not incorporate a series of microfacilities throughout Texas? Imagine the rainwater that could be harvested off the AstroDome...or the Austin Convention Center. Or better yet, imagine how much rain could be collected from parking lots. Many parking have underground runoff tanks that could be modified to store water. Any new parking lots could be required to do so. If the facility with the large roof or parking lot does not need much water, then their water could be piped to the plant nursery or grocery store down the road. In short, a whole new water utility enterprise could be initiated.

The beauty of rainwater systems becoming an integral part of each new development is that each new development will sustain itself. At my own

home, we have 2000 sf of roof and 2 10K tanks. Right now, we are at 75%. We have water efficient appliances and a water wise landscape. Other than that, we live like everyone else. And, we are not unique. At the last Hays County Water Conservation Conference I attended, someone asked for a show of hands for those that used solely rainwater. About 30 people out of about 200 raised their hands. And we're all doing just fine and loving our water.

The goal should be that every new development obtains at least 50% of its water from rainwater harvesting and reuses a portion of its greywater to flush the toilets. That is an aggressive water management strategy.

Sincerely,
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