Date: May 12, 2009

To: City/County Water and Wastewater Study Oversight Committee

From: Mike Letcher
City Manager

Chuck Huckelberry
County Administrator

Re: **City/County Stormwater Management Technical Paper**

As part of Phase II of the City/County Water and Wastewater Study, the City and the County have evaluated how we can best use stormwater and rainwater as a supplemental water source. The attached paper serves as an introduction and overview of the best use of stormwater and rainwater as supplemental water. It considers four criteria in evaluating the "best" use as follows:

Availability and reliability of stormwater and rainwater as a supplemental water source.

- Viability of using stormwater or rainwater to recharge groundwater.
- Legal constraints associated with water rights and water quality.
- Cost effectiveness of obtaining stormwater or rainwater as a supplemental source.

This paper includes a discussion of both rainwater and stormwater harvesting. It separates the existing built (constructed) environment from stormwater management that will occur in future development where new strategies and planning can be used to make the most efficient use of stormwater. It looks at options appropriate for retrofitting the existing built environment as well as options appropriate for future growth areas where new development provides an opportunity for larger scale stormwater harvesting solutions.

As you will find in the attached report, staff found that there are several opportunities to harvest rainwater and stormwater at different scales, i.e. regional to lot level. However, there are physical and legal challenges that impact our ability to use stormwater as a supplemental source including the variability of annual and seasonal rains, surface water rights, and water quality regulations.

The recommendations in the paper include:

1. Encourage Maximum Use of Rainwater and Stormwater at the Lot Scale

Rainwater can be harvested at the lot scale to eliminate some of the needs for potable water. Drought-tolerant native plants can typically be grown on passively-harvested water alone after supplemental water has been used to get them established. Rainwater harvesting in tanks is useful as a supplemental source for plants that are not drought-tolerant. Specific recommendations are as follows:

Existing Built Environment: In the built environment, the City of Tucson and Pima County should develop joint education and outreach about rainwater harvesting on why, how to, and where it can be utilized. Furthermore, estimating the volume of water available at the lot scale from increased impervious surfaces would allow the potential uses of this water to be better assessed.

Future Development: The City of Tucson and Pima County should pursue the development of joint landscape, building and zoning standards that increase the potential for on-site capture, storage, and use of rainwater. Incentives to HOAs and builders should be considered.

2. Encourage Maximum Use of Stormwater at the Neighborhood Scale

Future development should be built to maximize the potential for use of stormwater at the neighborhood scale. Supporting vegetation using harvested stormwater will eliminate the need for some landscape watering. Stormwater flow paths can be depressed to encourage the potential for infiltration and native vegetation can be planted that will thrive in these depressed flow paths. In some cases, development standards and HOA regulations may need to be modified to accommodate this strategy. Such a strategy will have the additional benefit of reducing flood peaks and improving stormwater quality. The viability of using dry wells should be re-evaluated in new subdivisions where sediment loads are expected to be low, and there is a reasonable possibility for the water to be recharged.

3. Limit Floodplain Encroachment on Regional and Tributary Watercourses

Because Regional Watercourses, and their associated floodplains, are important conduits for recharge, they should not be encroached upon so that they function during large events that are so important to recharge. Likewise, limiting encroachment will limit the possibility of movement of contaminants into the regional watercourses.

4. Manage Tributary Watercourses for Recharge or Stormwater Capture

Where the built environment has resulted in an abundance of impervious surfaces, stormwater capture should be considered. Where future development occurs, Tributary Watercourses should be managed to reduce flood peaks and encourage infiltration on Regional Watercourses. This can be accomplished using structural means, such as the construction of detention basins, or non-structural means, such as floodplain management, to limit encroachment. The City of Tucson and Pima County should develop a joint policy for regional planning of multi-use facilities for stormwater harvesting, recreation and restoration.

5. Consider the Overall Economic Benefits of Rainwater and Stormwater Harvesting

Water harvesting has multiple benefits, especially at the lot and neighborhood scale. These benefits include increased floodwater retention, and limiting the migration of contaminants. Vegetation grown on harvested rainwater and stormwater reduces the demand on potable resources, mitigates the urban heat island, provides habitat, requires less energy, and reduces dependence on imported water sources. The synergy between these elements should be considered in evaluating the costs and benefits of rainwater and stormwater harvesting.

6. Advocate for a Legal Framework Conducive to Use of Stormwater

The City and County should continue to work with ADEQ to develop water quality standards and designations specific for groundwater recharge and habitat restoration for *inclusion* in the next triennial review.

In the Phase 1 report of this Water/Wastewater Study, the Committee recognized that rainwater and stormwater are valuable water resources that must be considered and put to use as part of our community's future overall water resource portfolio. The full costs and benefits of utilizing these sources needs to be compared to the costs and benefits of new imported water resources. The Additional Water Resources paper that is scheduled to be presented to the Committee in August will include this cost comparison information.

Recommendation

It is respectfully recommended that the Committee review this report and provide input to the City and County on its recommendations.

Attachment

c: John Bernal, Deputy County Administrator for Public Works
Jeff Biggs, Director, Tucson Water
Suzanne Shields, Director, Pima County Regional Flood Control District
Mike Gritzuk, Director, Pima County Regional Wastewater Reclamation
Priscilla Cornelio, Director Pima County Department of Transportation
Jim Glock, Director, City of Tucson Department of Transportation
Ernie Duarte, Director, City of Tucson Development Services
Evan Canfield, Chief Hydrologist, Pima County
Chris Avery, Chief Water Council, Tucson Water
Nicole Ewing Gavin, Assistant to the City Manager, City of Tucson
Melaney Seacat, Sr. Program Manager, Pima County Regional Wastewater Reclamation
Nicole Fyffe, Executive Assistant to the County Administrator, Pima County
Leslie Liberti, Director, City of Tucson Office of Conservation and Sustainable Development