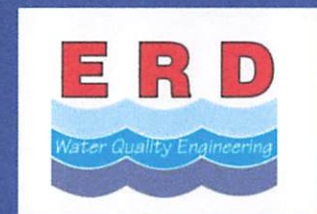


Impacts of Reuse Irrigation on Nutrient Loadings and Transport in Urbanized Drainage Basins

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Problems with Reuse

- **Relatively constant supply with highly variable demand**
 - Many users are bound by contracts which specify how much reuse must be used each day regardless of rainfall or irrigation needs
- **Reuse may contain elevated levels of TN and TP which are often much higher than in runoff**
- **Reuse systems have won numerous awards and managers and politicians view reuse as a problem which has been successfully solved**
 - Criticism of reuse practices is often ignored
- **Reuse has been elevated from an annoying disposal issue to an income generating resource for many municipalities**
 - Municipalities have begun to sell reuse water to other cities or counties to supplement:
 - Irrigation deficits for urban and agricultural uses
 - Potable water supplies

Problems with Reuse – cont.

- Water quality issues related to reuse are likely to become more visible in the future
- The use of wastewater reuse reduces potential for using stormwater for irrigation
- Additional nutrient loadings from reuse are invisible to current watershed loading models
- Reuse is exempt to many conservation rules governing irrigation
 - No limit on the number of watering days per week
 - No restrictions on time of day for watering
 - No restrictions on application depth
 - Rainfall shut-off sensors not required
 - Reclaimed water is currently cheaper than potable sources
- Utility departments are passing impacts of wastewater disposal to the stormwater divisions

Inappropriate Uses for Reuse?

- Since reuse has a pollution potential and lacks rigid controls, some uses should be evaluated for appropriateness
 - Urban irrigation
 - Depends on nutrient concentrations
 - Street sweeping operations spray water
 - Has potential to place soluble nutrients on road surface which can be mobilized by next rain event
 - Dust control
 - Limited to pervious areas with no runoff potential
 - Natural system restoration
 - Potential nutrient overload
 - Aquifer recharge
 - Potential for leeching into springs and surface waters

Recommendations

- Nutrient content should be routinely evaluated for all reuse water
- All reuse water applied on areas where there is a potential to enter a waterbody must be treated to AWT standards
 - However, even when water is treated to AWT standards, the concentrations may still be greater than runoff
- Conservation rules should apply to reuse as well as potable water
- Utilities should be required to educate their reuse customers concerning the nutrient content of the supplied reuse water and impacts on lawn fertilizer requirements
- Reuse ponds on golf courses should be independent from the stormwater system and should be designed to minimize/eliminate off-site pond discharges
- Reuse should be applied on an “as needed” basis only

Recommendations – cont.

- Strict guidelines should be developed which prohibit overspray of reuse onto paved surfaces
- Incorporate reuse impacts in watershed loading models
- Wet weather storage should be provided so that irrigation patterns can be modified in response to rainfall
 - Contracts should be modified to eliminate required daily consumption of reuse
- Spatial models could be used to evaluate potential reuse impacts when planning new systems
- “Pay me now or pay me later”
 - Managers must weigh cost of AWT vs. cost of multiple surface water quality improvement projects

Questions?