

TEXAS FOREST SERVICE

The Texas A&M University System

December 7, 2001

Patsy Gillham
13110 Chavile
Cypress, TX 77429

Dear Ms. Gillham:

At your request as a member of the Cypress Creek Coalition, I conducted an American Forests "Citygreen" environmental analysis of a typical one-acre site that would be located in the Cypress Creek watershed. "Citygreen" is a computerized software program developed by American Forests, a national non-profit, which helps communities analyze the economic impact of trees, forests and vegetation in terms of pollution mitigation, energy conservation and stormwater management. In other words, "Citygreen" demonstrates that trees and vegetation are an essential part of the local infrastructure of a community.

In assessing this one-acre site, a satellite image was used to obtain canopy and ground coverage information and the Soil Survey of Harris County was referenced for soil type. In addition to the satellite imagery used to assess the canopy coverage, other factors considered were the size, species and condition of the trees. For purposes of simplifying the data it was determined that the species composition along Cypress Creek is mainly pine/oak, the average size of the trees on site were 10 inches diameter breast height (dbh) with an average height classification of greater than 45 feet in height and an overall health condition ranking of fair.

The following is a list of annual pollution removal benefits as calculated by the American Forests "Citygreen" software program that the trees on this site provide to the surrounding community:

<u>Pollutant</u>	<u>lbs. removed</u>	<u>Removal value in \$</u>
Ozone	32	\$99.00
SO2	11	\$8.00
NO2	17	\$52.00
PM 10	30	\$62.00
CO	4	\$2.00
Total:	94	\$223

In addition to the pollutants listed above, the trees on this site store an estimated 43 tons of carbon and sequester another 680 lbs./year.

In order to determine stormwater analysis several factors are considered including soil type, percent slope average 2-year 24-hour storm event, and vegetation type and coverage. The soil type was classified somewhat impervious, percent slope is 0-1% and the rainfall from the 2-year 24 hour storm event is listed as 5 inches. One advantage of using the Citygreen program in analyzing stormwater runoff on sites is that different scenarios can be modeled. For the purposes of this report, two scenarios were compared for modeling stormwater runoff increase; forested vs. all paved conditions. While it is acknowledged that

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pavement may not cover 100 percent of any new development; modeling of this assumption will provide a base number to start from in reviewing future scenarios.

The following is the change in stormwater runoff characteristics between the two scenarios, scenario 1 which is forest and scenario 2 which is 100 percent pavement:

	<u>Scenario 1 (current)</u>	<u>Scenario 2 (paved)</u>
Runoff Depth	2.26 inches	4.74 inches
Peak Flow	1.98 cubic feet/second	5.15 cubic feet/second
Time of concentration	. . . hours (20 minutes)	0.07 hours (4 minutes)
Runoff volume	62,037 gallons	128,673 gallons

Other stormwater analysis results are as follows:

Runoff is increased by 107 percent.

Peak flow is increased by 162 percent.

Time of concentration is decreased by 61 percent.


Storage volume required to mitigate the change in peak flow is 2,738 cubic feet.

Volume of runoff is increased by 66,636 gallons.

In developing the "Citygreen" program, American Forests uses formulas from the U.S. Natural Resources Conservation Service (NRCS) Technical Release 55 (TR55). TRR-55 is a model for estimating stormwater runoff in small urban watersheds, and is widely used across the country for stormwater planning and urban engineering analyses. In addition, Citygreen uses an air pollution and quality model, Urban Forests Effects (UFORE), developed by David Nowak, PhD of the U.S. Forest Service. This model estimates how any pounds of ozone, sulfur dioxide, nitrogen dioxide, PM10 and carbon monoxide are deposited in tree canopies as well as the amount of carbon sequestered. The UFORE model is based on data collected from 50 U.S. cities and the dollar values for air pollutants are based on the median value of the externality costs set by the State Public Service Commissions in those states.

The information detailed in this letter lists the stormwater and pollution mitigation benefits that the current canopy provides. No opinion as to the amount or type of development, proposed or otherwise, is made or implied by the Texas Forest Service. If you have questions or if I can be of further assistance please feel free to call me at 713-688-8931.

Sincerely,



Michael Merritt
Bayou Region Urban Forester
Texas Forest Service