APPENDIX C ESTIMATION OF VEGETATIVE COVER

ESTIMATION OF VEGETATION COVER

An estimate of percent vegetation cover is needed when selecting the Rational Method runoff coefficient (C) from Figures 2-2 through 2-6, and for adjusting the hydraulic conductivity value with the Green and Ampt infiltration equation (Figure 3-1). The following information is provided to assist in the estimation of percent vegetation cover.

- 1. The percent vegetation cover is the percent of the land surface that is covered by vegetation. Vegetation cover is evaluated on plant basal area for grasses and forbs (broad leaf plants that are generally called flowers and weeds), and on canopy cover for trees and shrubs. Vegetation litter, if significant, should be considered as vegetation cover.
- 2. Vegetation types in Arizona that basically affect the runoff process are often divided into the following groups:

Desert Brush: includes such plants as mesquite, creosote bush, black bush, catclaw, cactus, and so forth; desert brush is typical of lower elevations and low annual rainfall.

Herbaceous: includes short desert grasses with some brush; herbaceous vegetation is typical of intermediate elevations and higher annual rainfall than in desert areas.

Mountain Brush: mountain brush mixtures of oak, aspen, mountain mahogany, manzanita, bitter brush, maple and so forth; mountain brush is typical of intermediate elevations and generally higher annual rainfall than in herbaceous areas.

Juniper-Grass: juniper areas mixed with varying grass cover that is generally heavier than desert grasses due to higher annual precipitation: juniper areas are typical of higher elevations.

Ponderosa Pine: ponderosa pine forests are typical of high elevations and high annual precipitation such as along the Mogollon Rim, the Kaibab Plateau, the White Mountains, and so forth.

- 3. If one-half or more of the drainage area has a given vegetation type, consider all the drainage area as having that vegetation type. If the vegetative type appears about equally divided among all types of hydrologic cover, consider it all as herbaceous, as these considerations result in average values.
- 4. The Soil Conservation Service determines vegetation cover density by field surveys of carefully selected locations within the drainage area. However, for highway drainage design where runoff from numerous small drainage areas is to be determined, an approximation of the vegetative cover based on visual observation will be adequate.

Three broad ranges of vegetative cover density have been established.

- Poor 0 20% vegetative cover
- Fair 20% 40% vegetative cover



Good 40%+ vegetative cover

Some representative values for vegetative cover densities are shown in the following photographs:



Photo 1

Location: Highway 89 near Congress Vegetation Type: Desert Brush Cover Density: 10%, Poor





Location: Hualapai Mountains near Yucca Vegetation Type: Desert Brush Cover Density: 30%, Fair

Note: Vegetation cover density greater than 40% for desert brush is not found in Arizona.



Location:	I-40 near Seligman
Vegetation Type:	Herbaceous
Cover Density:	15% <i>,</i> Poor







Location: County road near Wagoner Vegetation Type: Mountain Brush Cover Density: 24%, Fair



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Location:	Highway 89 near Wilhoit
Vegetation Type:	Mountain Brush
Cover Density:	75%, Good





Location:	I-40 near Ashfork
Vegetation Type:	Juniper-Grass
Cover Density:	29%, Fair





Location: I-17 near Stoneman Lake Vegetation Type: Juniper-Grass Cover Density: 63%, Good



The vegetative cover densities shown in Photos 1-7 have been determined in the following manner:

- 1. An area representing the typical vegetative cover density for the drainage area is selected.
- 2. A 100-foot chain is stretched out between two posts, approximately 3-ft. above ground level.
- 3. The intercepts of the vegetative cover along the 100-ft. length are noted.
- 4. The total distances covered by vegetation and litter along the 100-ft. length are summed up and represent the percent of vegetative cover for the selected area.
- 5. Several determinations may have to be made to compute the average percent of cover for the drainage area.

The following sketch illustrates the field procedure:



Vegetative Cover = 0.1 + 0.05 + 4.5 + 0.1 + 0.15 + 0.1 + 2.1 + 0.1 + 0.25 + 0.1 + 0.1 + 18.5 + 1.0 + 0.1 + 0.15 + 7.0 + 0.45

Density = 34.85%

