

**SECTION 685.5 DESIGN OF A  
TAILWATER RECOVERY SYSTEM**

Example:

Given

Field Data	(Intake Family 0.5)
Soil, Hastings silt loam	(Design Group 4)
Furrow slope	= 0.8%
Furrow spacing	= 3.0 feet
Length of furrow	= 1,650
Yield of well	= 1,000 gpm
Pumping head	= 300 feet
Pumping head of reuse pit	= 45 feet
Crop	= corn
Net Application	= 3.0"

From the IRMA table, page 124, 20 gpm stream size for 14.29 hours of application will apply 3.0 net inches of irrigation with .4 inches of deep percolation and 2.15 inches of runoff with a gross application  $F_i = 5.56$ .

Percent of water that will run off is:

$$\frac{R_o}{F_i} = \frac{2.15}{5.56} = 39\%$$

Total water that will run off from one set is .39 x 1,000 gpm x 60 min/hr x 14.29 hr = 334,386 gal.

The landuser wants to use the runoff water on another field. It is his intention to start irrigation on the other field just before the initial set has been completed.

The 334,386 gal. or

$$\frac{334,386 \text{ gal}}{325,850 \text{ gal./Ac.Ft}} = 1.03 \text{ Ac.Ft.}$$

would satisfy this need.

Engineering Standard 447 states that the reuse pit should store approximately one-half of the total volume delivered to the initial set if it is pumped back into the initial system and the system doesn't have any provision for regulating initial flow.

If the system were designed this way, the storage needed would be

$$\frac{1000 \text{ gpm} \times 60 \text{ min/hr} \times 14.29 \text{ hr.}}{2} = 428,700 \text{ gal.} = 1.32 \text{ Ac.Ft.}$$

In both cases, provision for extra depth should be made for freeboard and dead storage.