

SOUTHERN ILLINOIS UNIVERSITY
Department of Civil and Environmental Engineering

CE 370- Fluid mechanics
Summer 2009

Assignment-6

Date Assigned: July 27, 2009

Date Due: August 3, 2009

1. The pressure drop in a smooth horizontal pipe in a turbulent, incompressible flow depends on the pipe diameter, pipe length, fluid velocity, fluid density, and viscosity.

$$\Delta p = f(D, L, V, \rho, \mu)$$

Find a nondimensional relationship for the pressure drop.

2. A 3-ft tall model of a spillway is placed in a 12-in wide laboratory flume. Under an upstream head of 0.375 ft, the flow in the flume is 0.8 cfs. What flow does this represent in the real (i.e., prototype) system if the model is built at a scale of 1:25, with the exception that the prototype model is built 675-ft wide?