

## REFERENCES

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## PROBLEMS

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- 3.1 A pipe discharges from a pond at a rate of 40,000 gpm. What is the flow in cfs?
- 3.2 During an emergency release, the water level in a 12,000-ac reservoir dropped by 1 inch in 6 hours. What was the discharge rate in cfs?
- 3.3 The last flow gaging station on the Susquehanna River before it enters the Chesapeake Bay is at the Conowingo Dam. The average flow recorded at this station is  $2,500 \text{ m}^3/\text{s}$ . What is the total amount of water (in  $\text{m}^3$ ) that flows into the Chesapeake Bay from the Susquehanna River in an average year?
- 3.4 A square detention pond has a  $100 \times 100$ -ft, level bottom and 3H:1V side slopes. What volume of water can the pond hold if the depth is 5 ft?
- 3.5 The discharge in a stream is 125 cfs. Downstream of the monitoring point, a 30-in. storm sewer is discharging into the stream. The pipe is flowing full and the average velocity is 5 ft/s. What is the total discharge in the stream downstream of the storm sewer discharge?
- 3.6 The shape of a runoff hydrograph from a subdivision for a particular storm event can be approximated as a triangle. The duration of the event was 18 hours. The peak flow was  $3.4 \text{ m}^3/\text{s}$  and it occurred 4 hours after the start of the runoff hydrograph. What was the total volume of runoff produced?
- 3.7 A rainfall event is quantified as follows:
- 30 minutes at 0.25 in/hr
  - 60 minutes at 0.50 in/hr
  - 45 minutes at 0.15 in/hr
- The precipitation occurs over a 500-ac watershed. What are the total volume of rainfall (in  $\text{ft}^3$ ) and the equivalent rainfall depth (in in.)?
- 3.8 Water is flowing in an open channel at a depth of 4 ft and a velocity of 7.5 ft/s. It then flows down a chute into another open channel where the depth is 2 ft and the velocity is 30 ft/s. Assuming frictionless flow and  $\alpha = 1$ , determine the difference in elevation between the channels.