BF 09899 Hwy 43 Over Paddle River
Hydrotechnical Summary

Channel Capacity :

S = 0.0008
B = 10 m, h = 4 m, T_h = 25 m
Use AT Equation

At Bank Height : Y = 4.0 m, V = 1.6 m/s, Q = 110 cms
At Channel Capacity : Y = 5.0 m, V = 2.0 m/s, Q = 190 cms

Historical Highwater Data :

HW was observed in June 1944, June 1954, and April 1974 with Y estimates in the 4.5 – 6.5m range. HW was also noted in 1924 (bent washout), 1935 (ice damage), 1939 (abutment washout), June 1985 (Y ~ 3m), and August 1989 (Y ~ 2.5m). The 2004 twinned bridge design was based on Y = 5.5m and Q = 200cms, assuming no routing from u/s dam.

Gauge 07BB011 (DA = 260km^2, 1973 – Now) was damaged during the 1989 event, but the published peak Q (225cms) suggests Y ~ 6m at peak. Q ~ 70cms is reported in July 1986 and July 1990. Gauge 07BB004 (DA = 625km^2, 1963 – Now) suggests HW in June 1965 with Q ~ 150cms. Dam routing calculations suggest that the peak inflow to the dam in August 1989 (DA ~ 620km^2, just u/s, built in 1986) was about Q = 250cms and the outflow was Q = 45cms. The largest storms in the storm database are about 155mm June 1944, 135mm in June 1965, 115mm in August 1989, and 100mm in July 1990.

Basin Runoff Potential :

d = 60 mm, T_p = 20 hrs, q = 0.85 cms/km^2.
Gross DA = 665 km^2.
Q_p = 560 cms.

Conclusion :

The channel capacity estimate is consistent with historic observations and is within the basin runoff potential. However, dam routing calculations suggest Q_{out} = 100cms for d = 60mm and Q_{in} = 250cms with starting elevation close to the long-term mean.

Recommended parameters : Y = 4.0 m, V = 1.6 m/s, Q = 110 cms.