

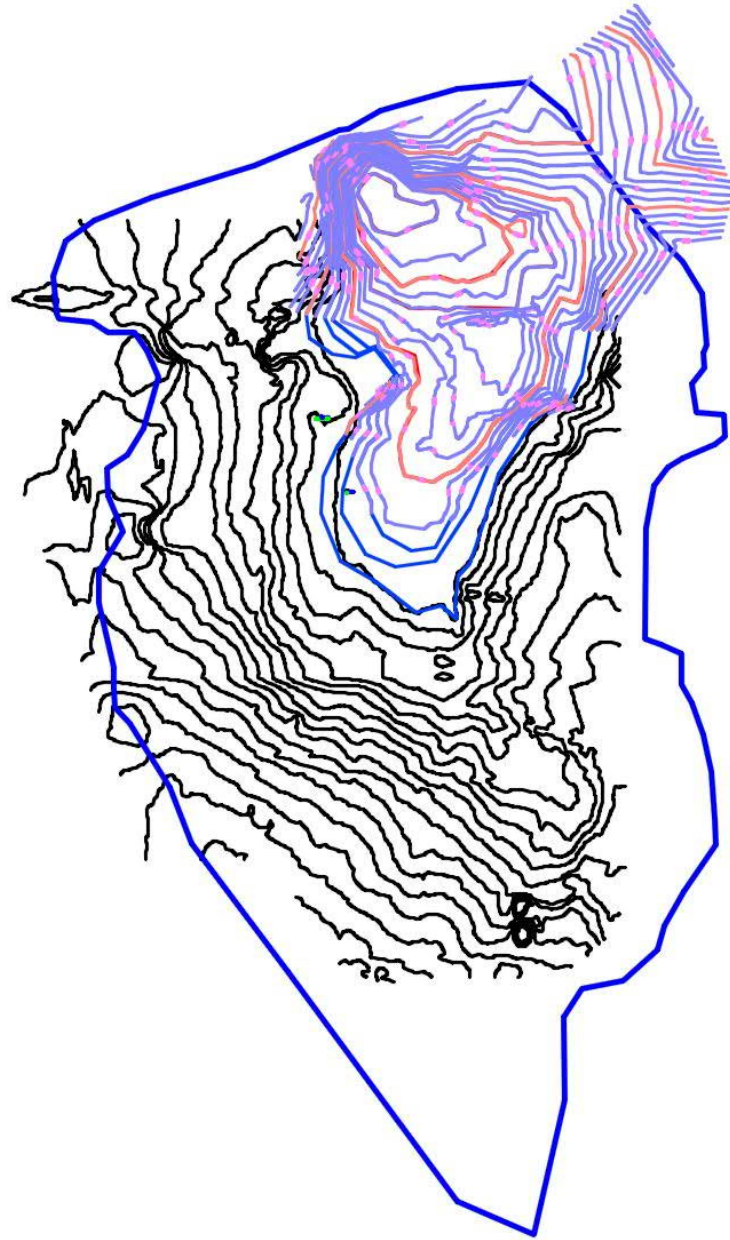


City of Springfield

Sinkhole Computations

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Wilson Hydro
CONSULTING ENGINEERS
AND HYDROLOGISTS, LLC 



Total DA
47 acres

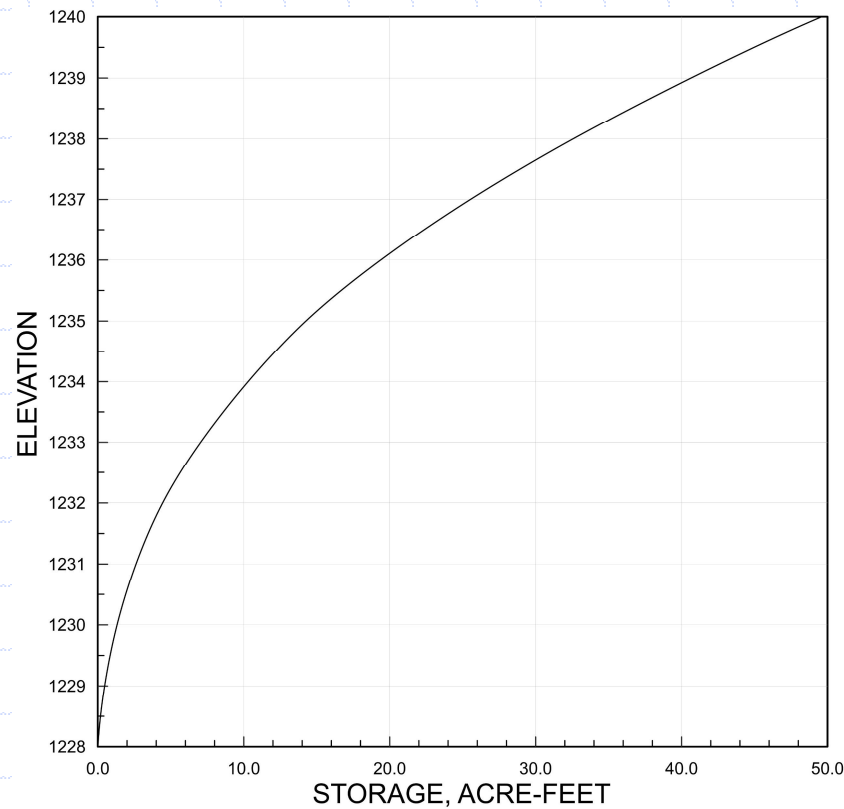
Sinkhole
area at
break over
7.56 acres

Contour data
courtesy of Dr.
Charles Patterson,
Allgeier, Martin, and
Associates.

Compute Stage-Volume

$$V = \left[A_1 + A_2 + \sqrt{A_1 \times A_2} \right] \times \frac{H}{3}$$

Conic Method



Compute Effective Precipitation Depth

NRCS CURVE NUMBER COMPUTATIONS

$$CN := 83 \quad S := \frac{1000}{CN} - 10$$

$$P := 7.21 \quad 1\% \text{ AEP, 24-hr}$$

$$P_e := \frac{(P - 0.2 \cdot S)^2}{(P + 0.8 \cdot S)} \quad P_e = 5.226$$


$$P := 11.01 \quad 1\% \text{ AEP, 7-day}$$


$$P_e := \frac{(P - 0.2 \cdot S)^2}{(P + 0.8 \cdot S)} \quad P_e = 8.884$$


$$P := 11.96 \quad 1\% \text{ AEP, 10-day}$$

$$P_e := \frac{(P - 0.2 \cdot S)^2}{(P + 0.8 \cdot S)} \quad P_e = 9.811$$

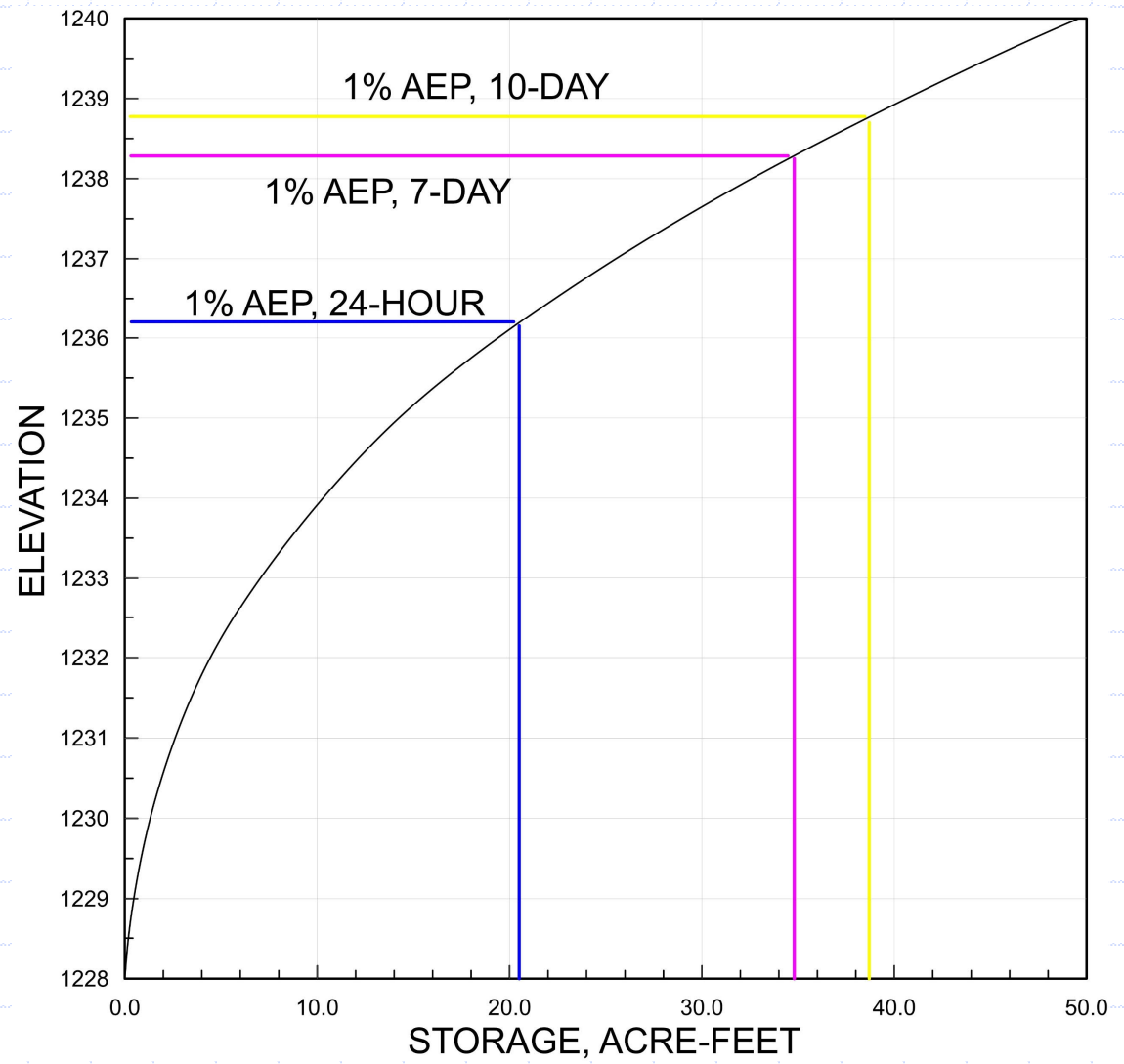
Compute Runoff Volume


$$\frac{5.226 \text{ inches}}{12 \text{ inches per ft}} \times 47.05 \text{ acres} = 20.5 \text{ ac} - \text{ft}$$

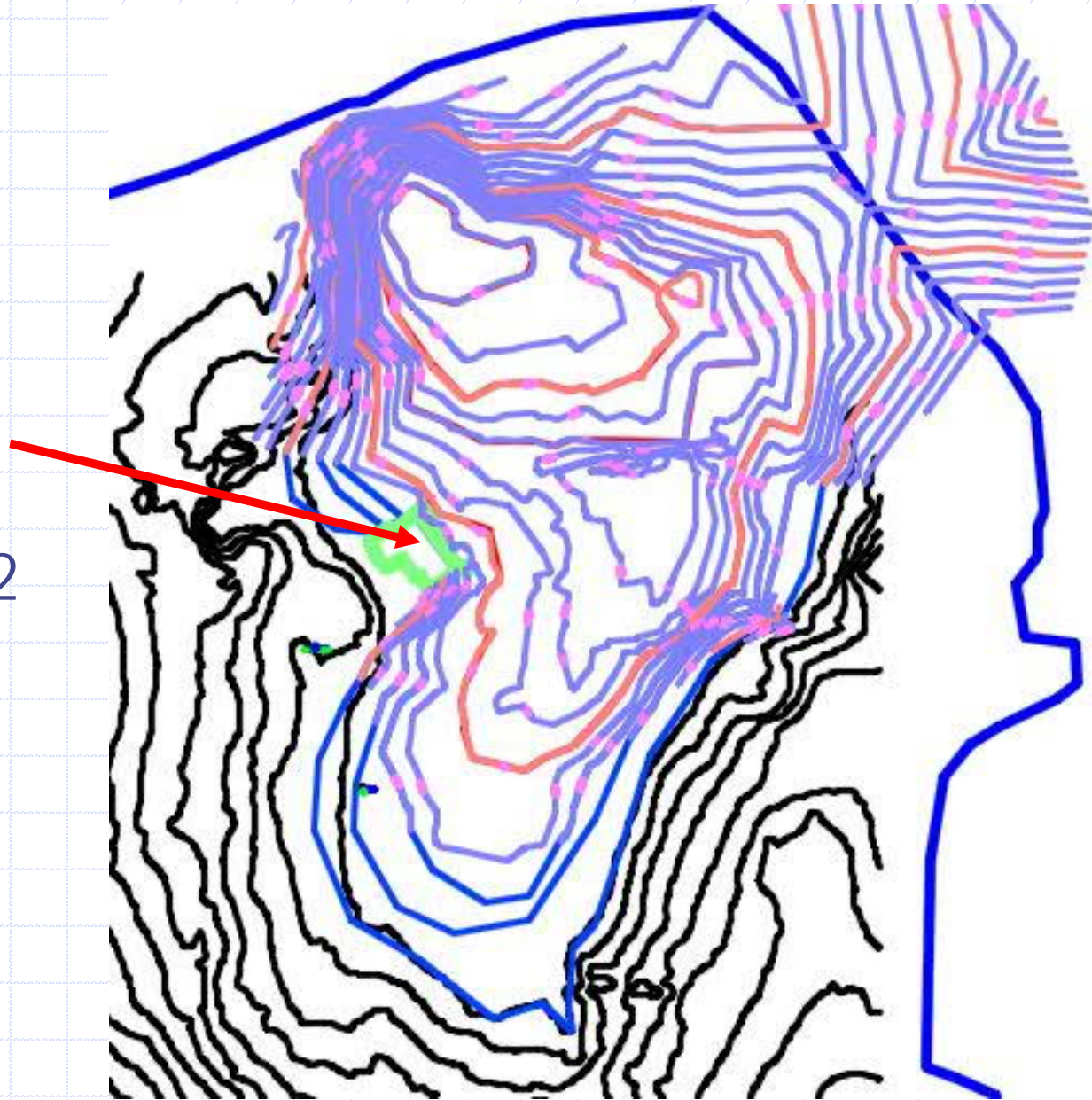

$$\frac{8.884 \text{ inches}}{12 \text{ inches per ft}} \times 47.05 \text{ acres} = 34.8 \text{ ac} - \text{ft}$$

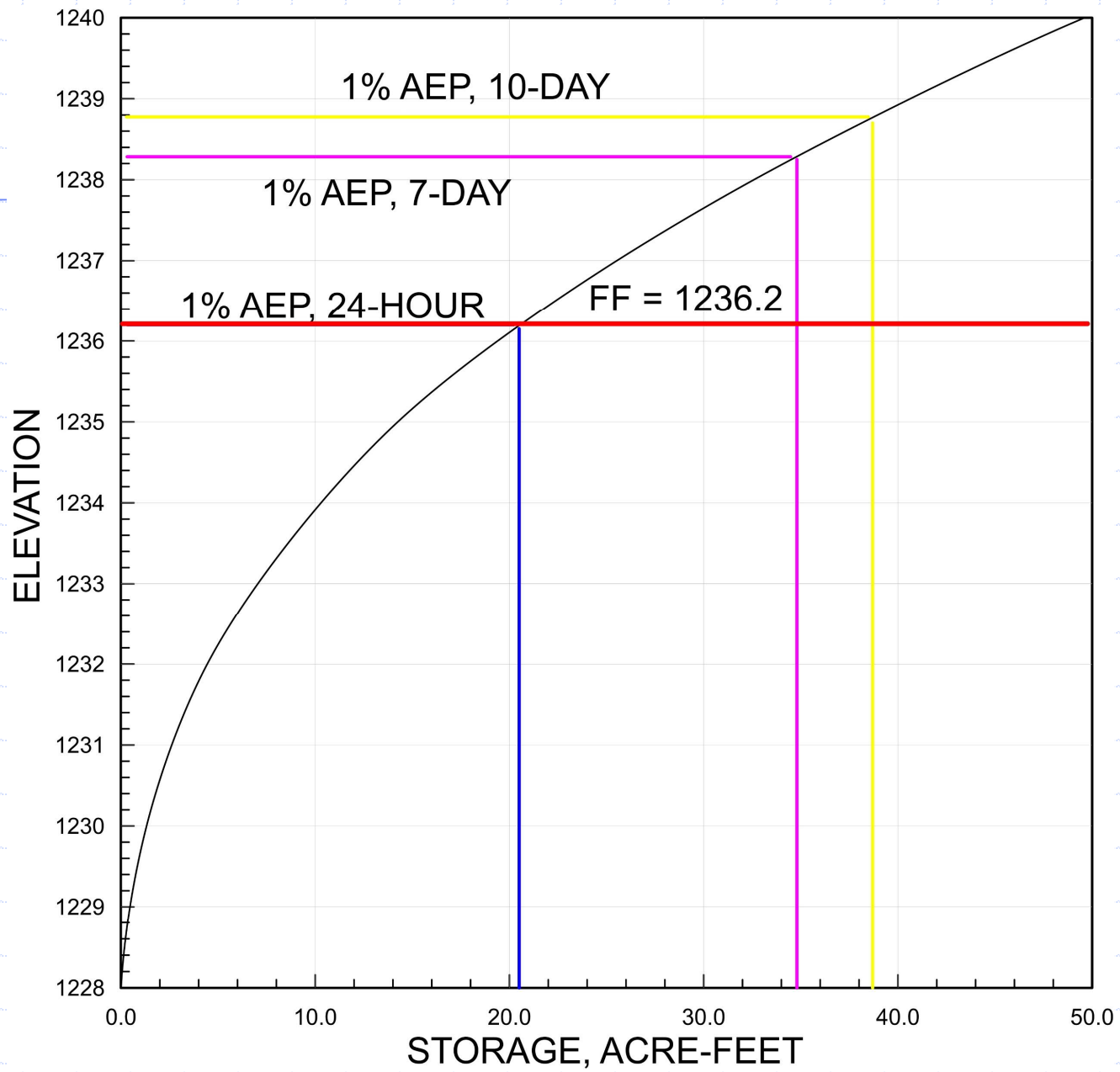

$$\frac{9.881 \text{ inches}}{12 \text{ inches per ft}} \times 47.05 \text{ acres} = 38.7 \text{ ac} - \text{ft}$$

Compute WSEL



Note:
\$450k
house,
FF 1236.2
Recall,
rim is at
1238







Questions?