Hydrogeologic Characterization of the Hoosick Falls Wellfield Aquifer

Inferred unconfined conditions and episodic recharge from flooding north of the wellfield

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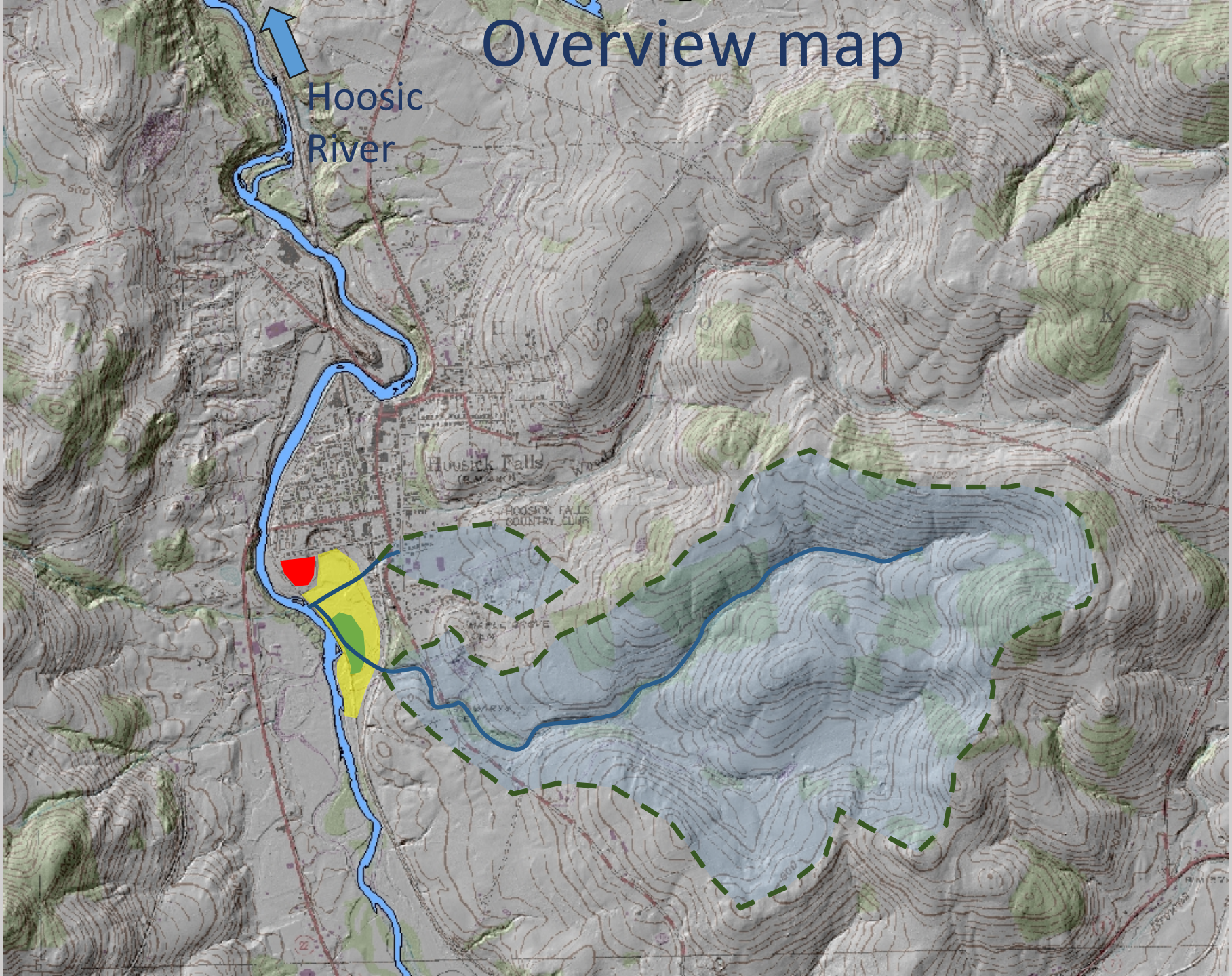

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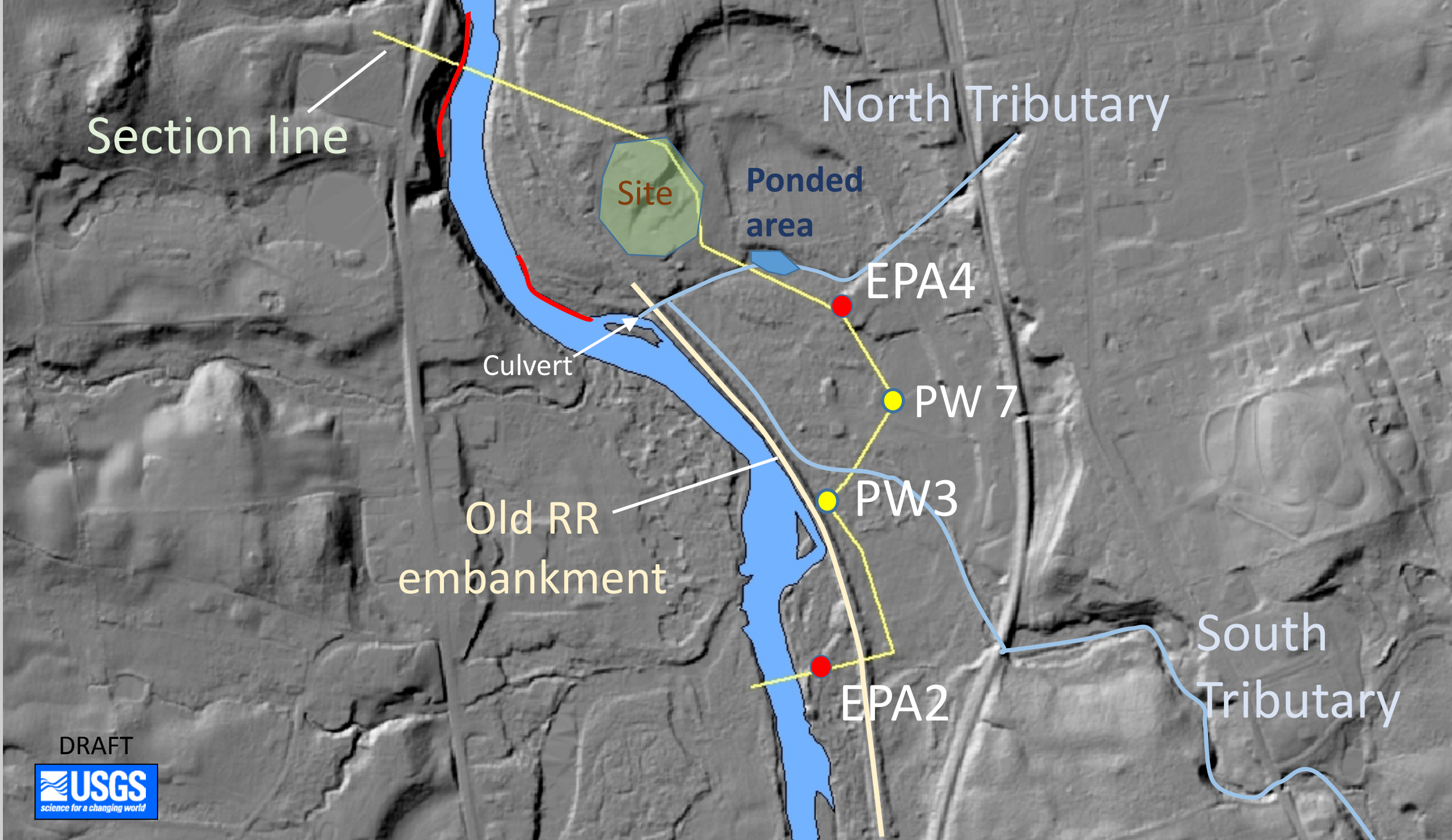
Section line
North Tributary
Site
Ponded area
EPA4
Culvert
PW 7
PW3
Old RR embankment
South Tributary
EPA2
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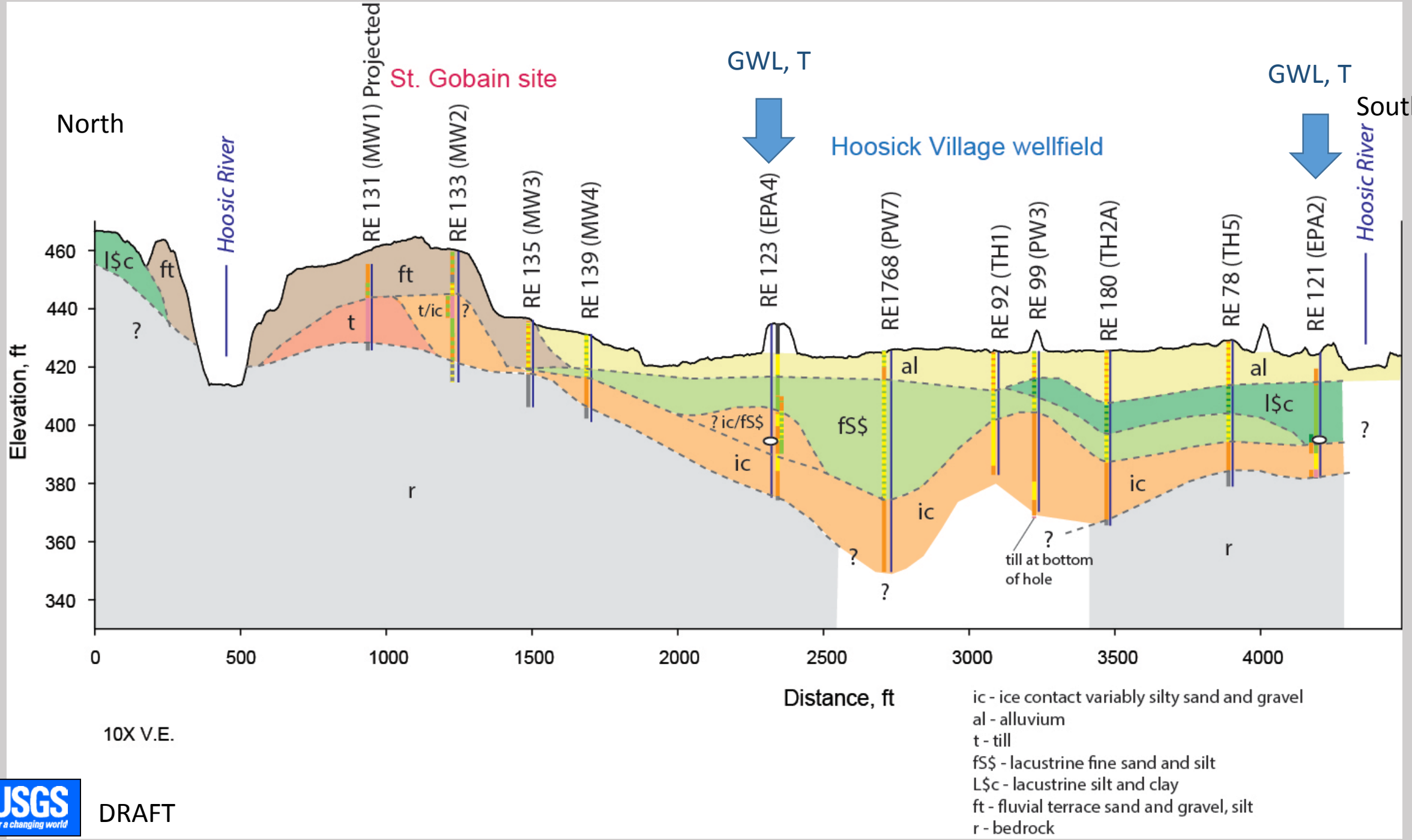
North
South
St. Gobain site
GWL, T
GWL, T
Hoosick Village wellfield
Hoosic River
Hoosic River
RE 131 (MW1) Projected
RE 133 (MW2)
RE 135 (MW3)
RE 139 (MW4)
RE 123 (EPA4)
RE1768 (PW7)
RE 92 (TH1)
RE 99 (PW3)
RE 180 (TH2A)
RE 78 (TH5)
RE 121 (EPA2)
Elevation, ft
460
440
420
400
380
360
340
0
500
1000
1500
2000
2500
3000
3500
4000
Distance, ft
l$c
ft
?
t
t/ic
?
ft
r
? ic/fS$
ic
fS$
al
ic
?
?
till at bottom of hole
?
ic
al
l$c
?
r
10X V.E.
ic - ice contact variably silty sand and gravel
al - alluvium
t - till
fS$ - lacustrine fine sand and silt
L$c - lacustrine silt and clay
ft - fluvial terrace sand and gravel, silt
r - bedrock

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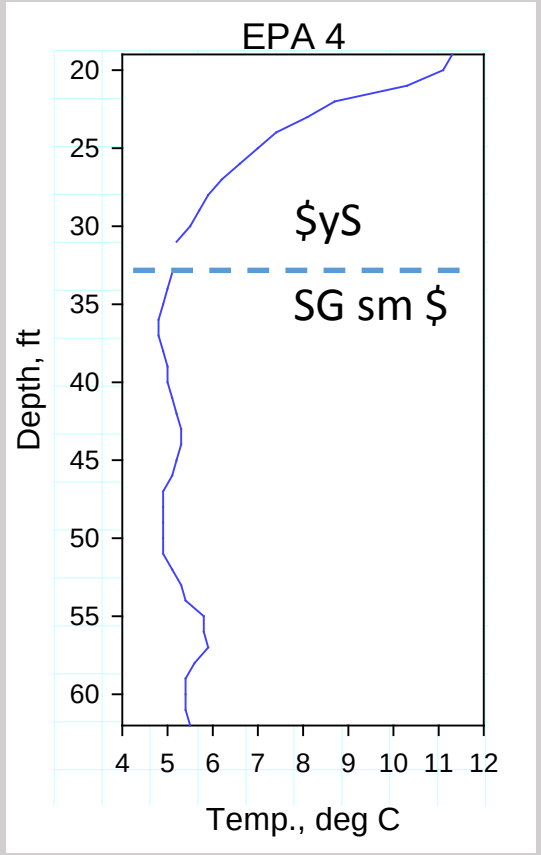
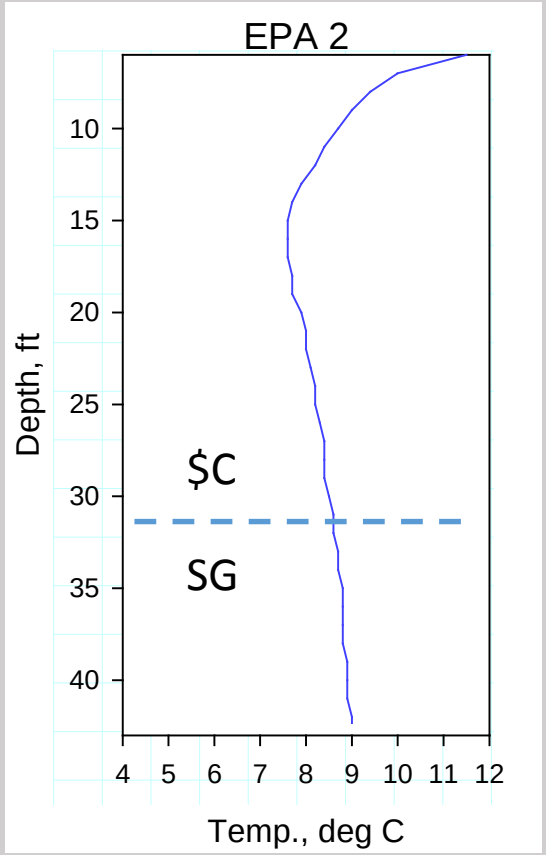
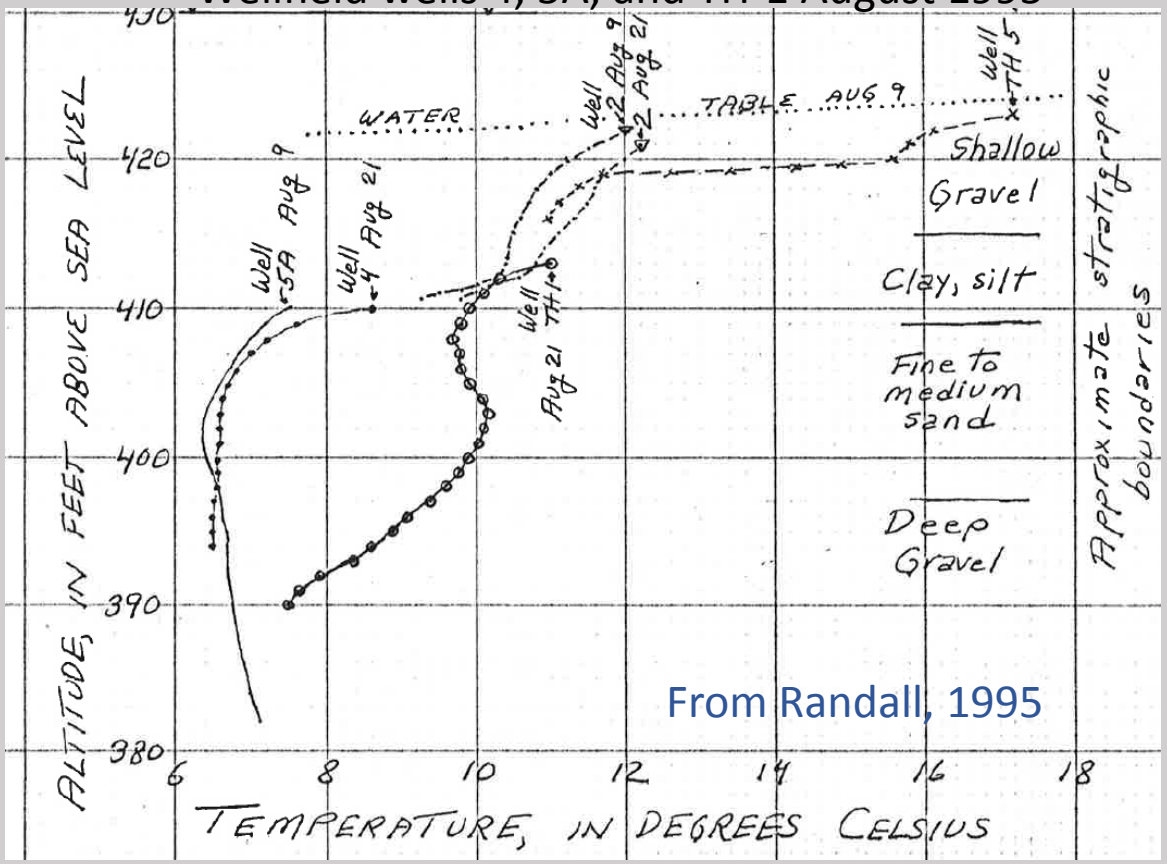
- Groundwater temperature profiles in wells indicate cold water in the deep aquifer– as low as 41° F.
  -Any surface-water source may provide cold water: stream and river flows are typically highest in the Spring, when water temperatures are cold.
  -The coldest temperatures were recorded at EPA 4.

June 2017

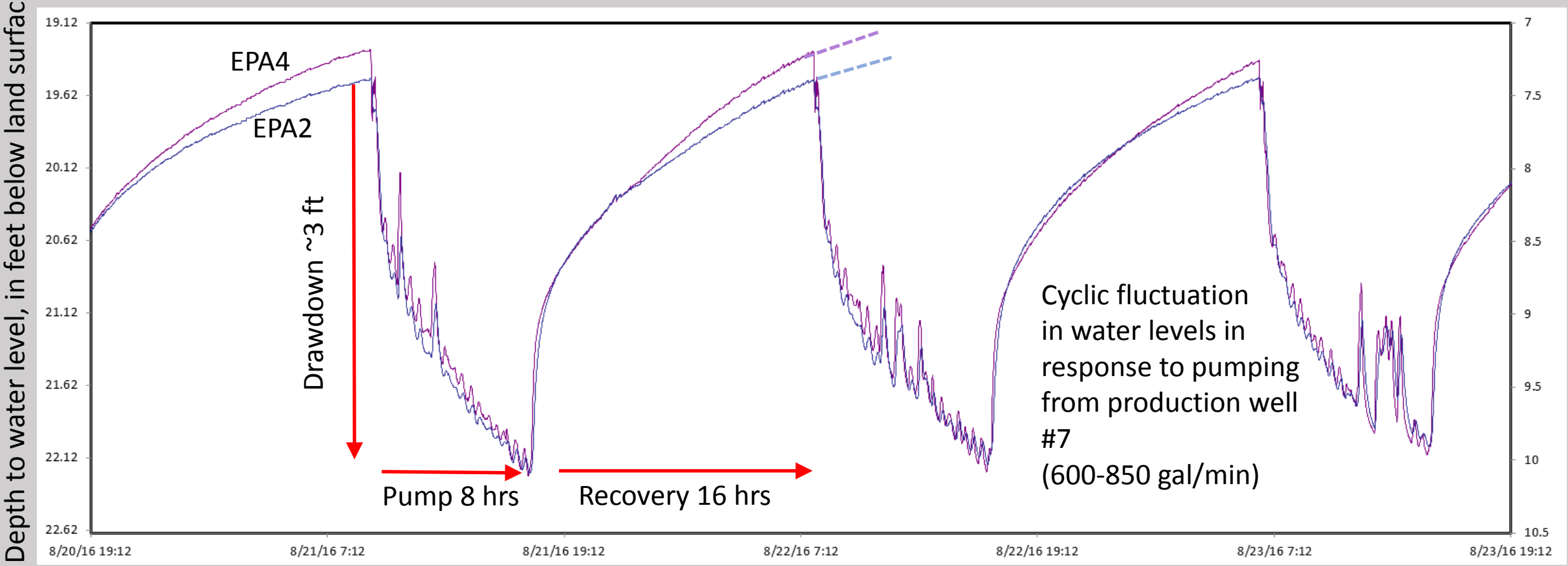




Wellfield wells 4, 5A, and TH-1 August 1995



Groundwater Level Monitoring at EPA2 and 4



EPA monitoring well #2
43-ft deep screened well
(1,120 ft south of production well #7)

EPA monitoring well # 4
60-ft deep screened well
(420 ft north of production well #7)

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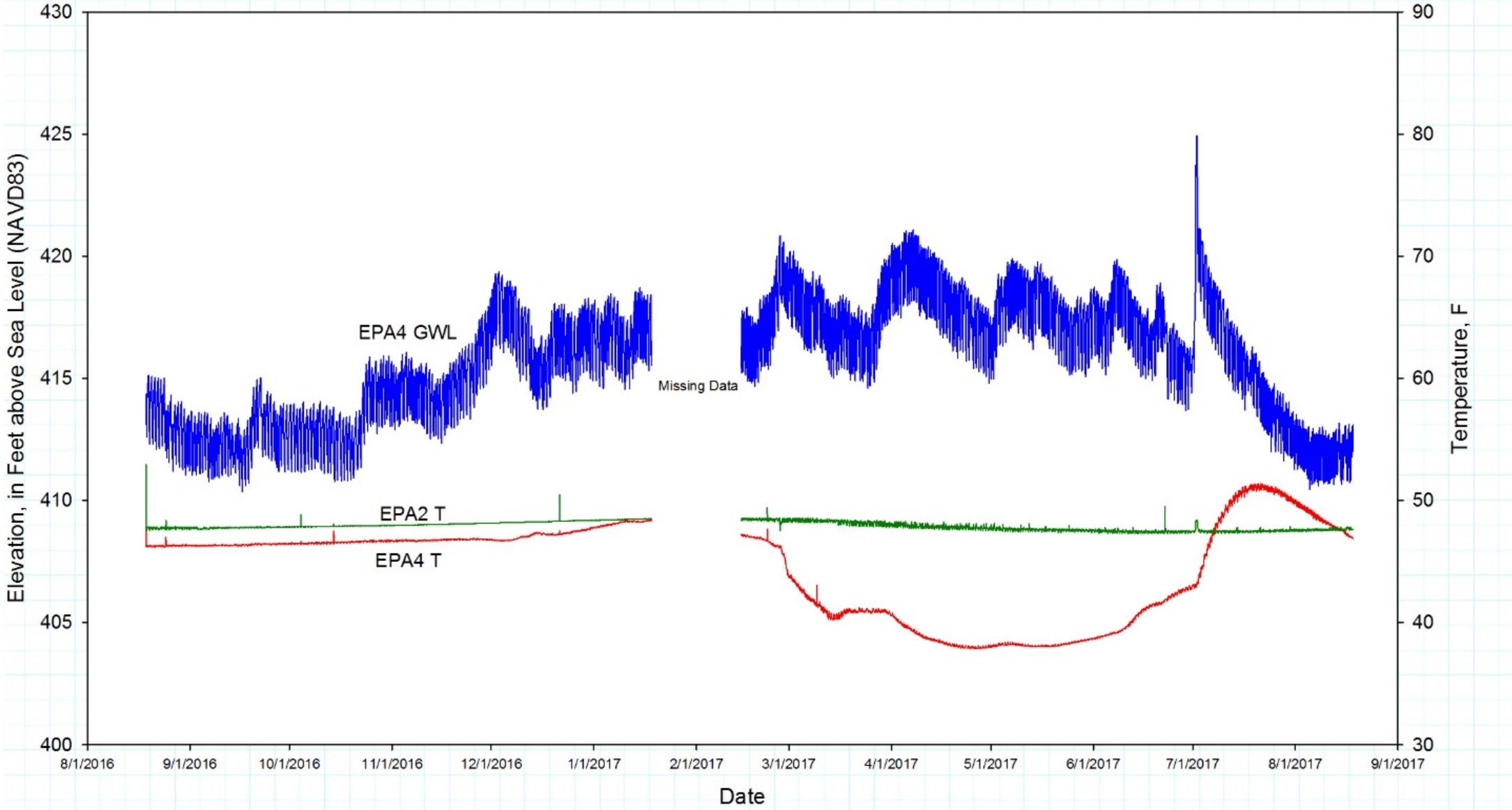
2016-2017 GW Level and Temperature Data



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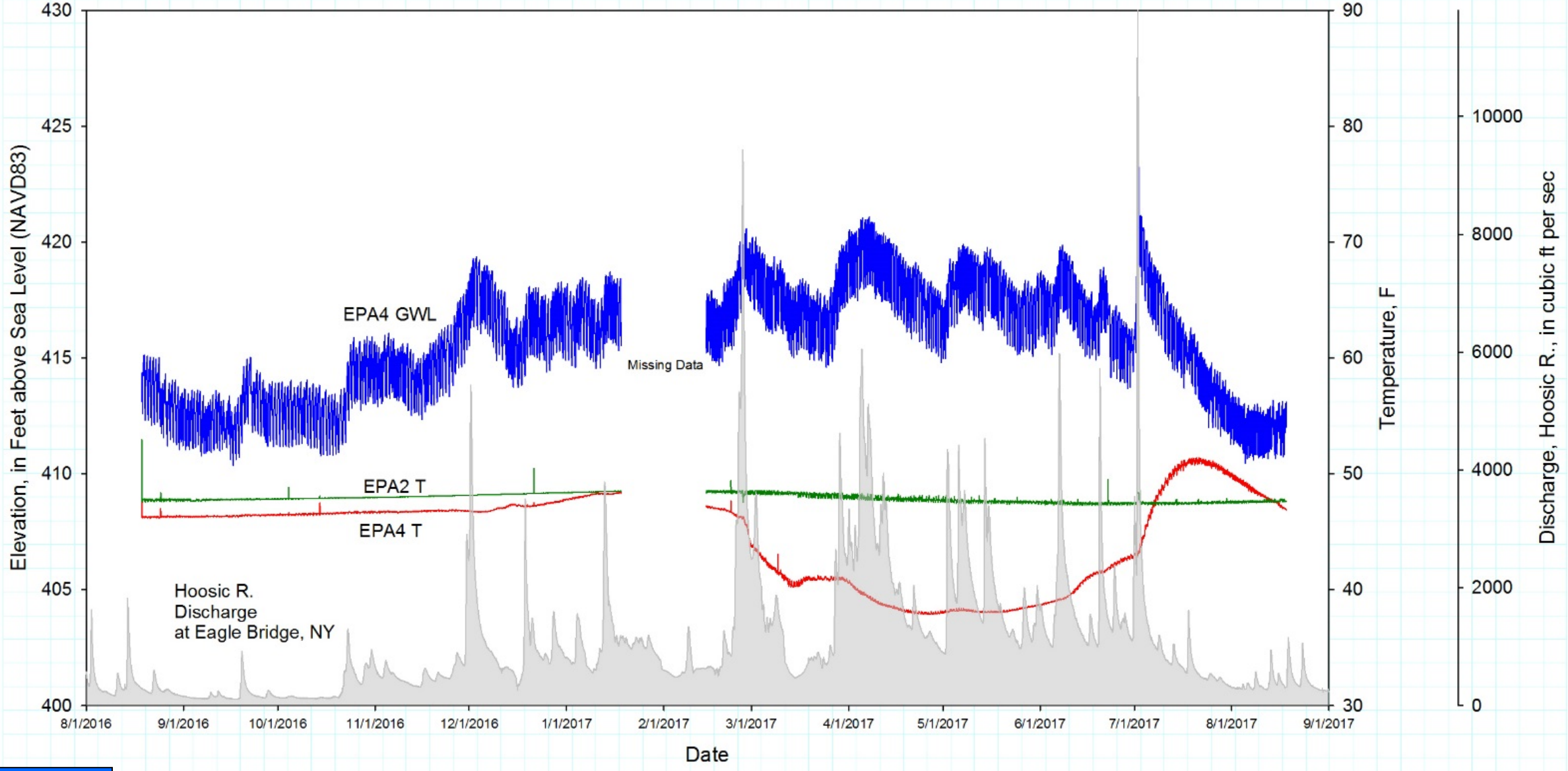
GW temperature changes at EPA 4 correspond to downstream gage high flows of ~4,000 to 6,000 cfs or greater



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However, EPA 4 is about 600 ft from the River…..

So, what's going on at the north end?

- This area and, less frequently, the wellfield, are known to flood periodically.
- Such flooding is inferred to recharge the aquifer where the confining unit is absent.
- The flooding is a result of the interplay of rapid tributary runoff and delayed Hoosick River high flows at the culvert.

Recent flood control work after ~ ½” rain
December 6, 2017

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Initial tributary flooding January 12, 2018

Photos courtesy of Doug Reed

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River and tributary flooding January 13, 2018

Hoosick R. stage 3-4’ over culvert

~4,660 cfs at Eagle Bridge Gage

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Photos courtesy of Doug Reed

EPA #4

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Photo courtesy of Doug Reed

Summary

- Localized unconfined aquifer conditions north of the Hoosick Falls wellfield are inferred from numerous lines of evidence.

- Episodic recharge by flooding through these unconfined aquifer areas contributes water to the wellfield aquifer.

Summary (continued)

- Understanding the hydrogeologic framework and modes of recharge are important for conceptualizing or identifying both potential source areas and pathways of PFOA entry into the aquifer (tributary watershed, floodplain, and unchanneled hillslope areas).

END