

Dewlish PWS: Impact on Devil's Brook

Presentation by Wessex Water
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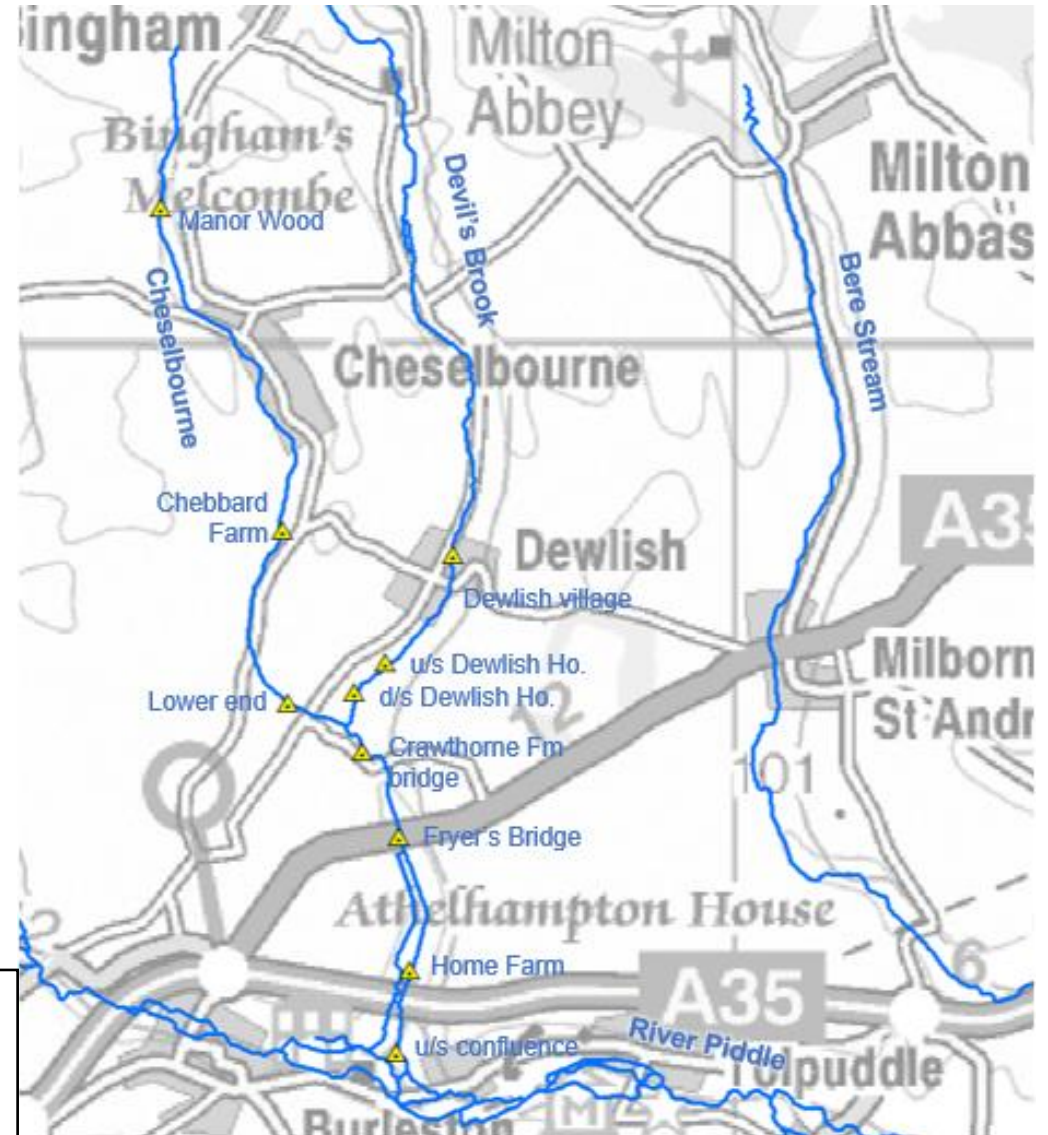
Wessex Water
YTL GROUP



AMP6 Devil's Brook investigation

Agenda

- Water Framework Directive
- Geology
- Hydrology and hydrogeology
- PWS development and use
- Dewlish PWS impact on flow
- Ecology health
- PWS change/river modifications
- Q&A



▲ Flow gauging sites

Water Framework Directive

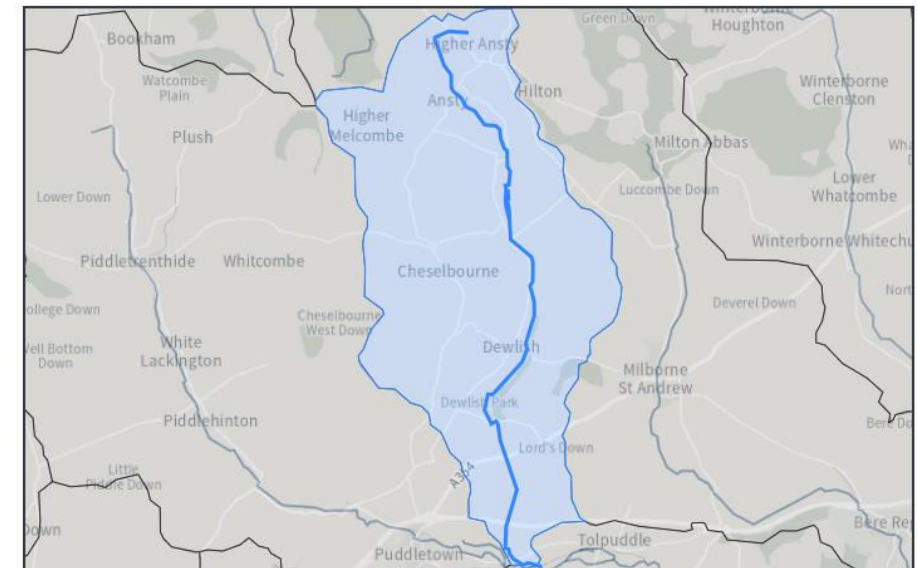


- All streams/rivers: water bodies
- Need to be in 'good' ecological/chemical status
 - One out all out
- Flow reduction indicate risk of failure

Department for Environment Food & Rural Affairs
Environment Agency Catchment Data Explorer

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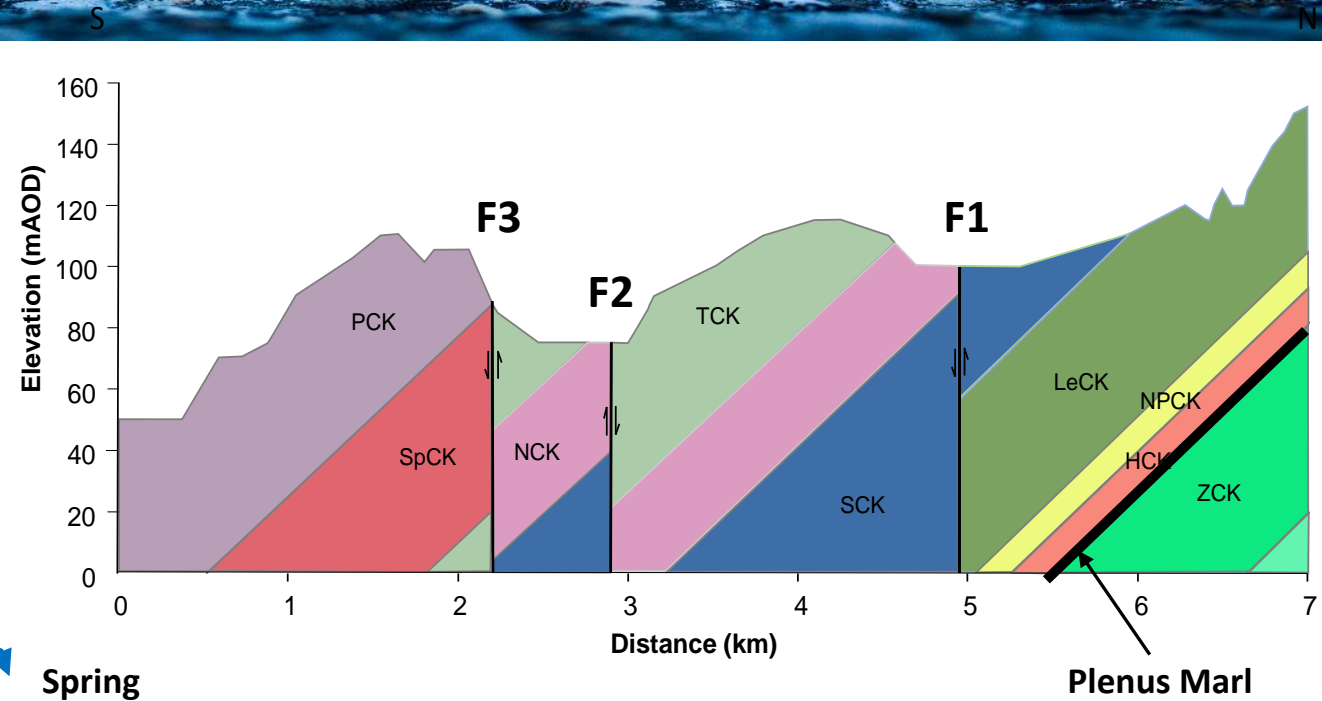
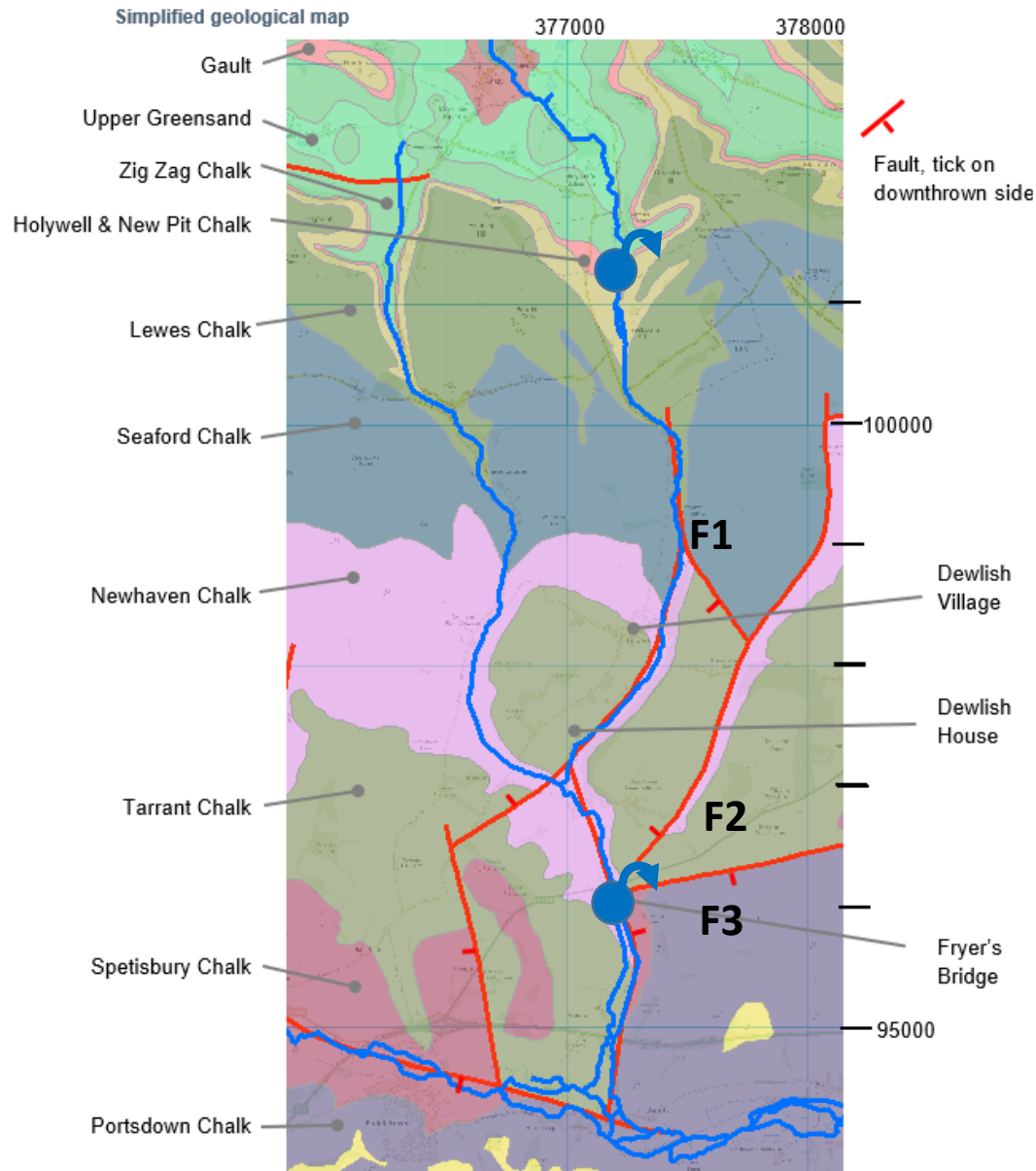
Devils Brook Water Body Bad ecological status



Classifications	
Time period:	Cycle 3
Classification Item	2019
Ecological	Bad
Biological quality elements	Bad
Fish	Bad
Invertebrates	High
Macrophytes and Phytobenthos Combined	Good
Macrophytes Sub Element	Good
Physico-chemical quality elements	Good
Acid Neutralising Capacity	High
Ammonia (Phys-Chem)	High
Dissolved oxygen	High
Phosphate	Good
Temperature	High
pH	High
Hydromorphological Supporting Elements	Supports good
Hydrological Regime	Does not support good
Morphology	Supports good
Specific pollutants	High
Copper	High
Zinc	High
Chemical	Fail
Priority hazardous substances	Fail

<https://environment.data.gov.uk/catchment-planning/WaterBody/GB108044010130>

Geology







Spring

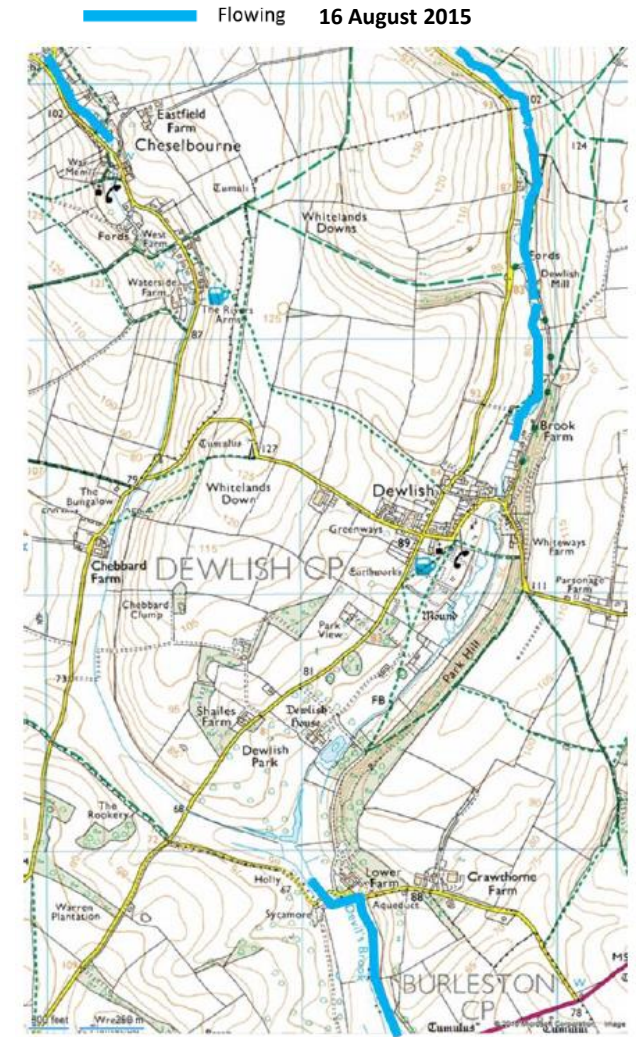
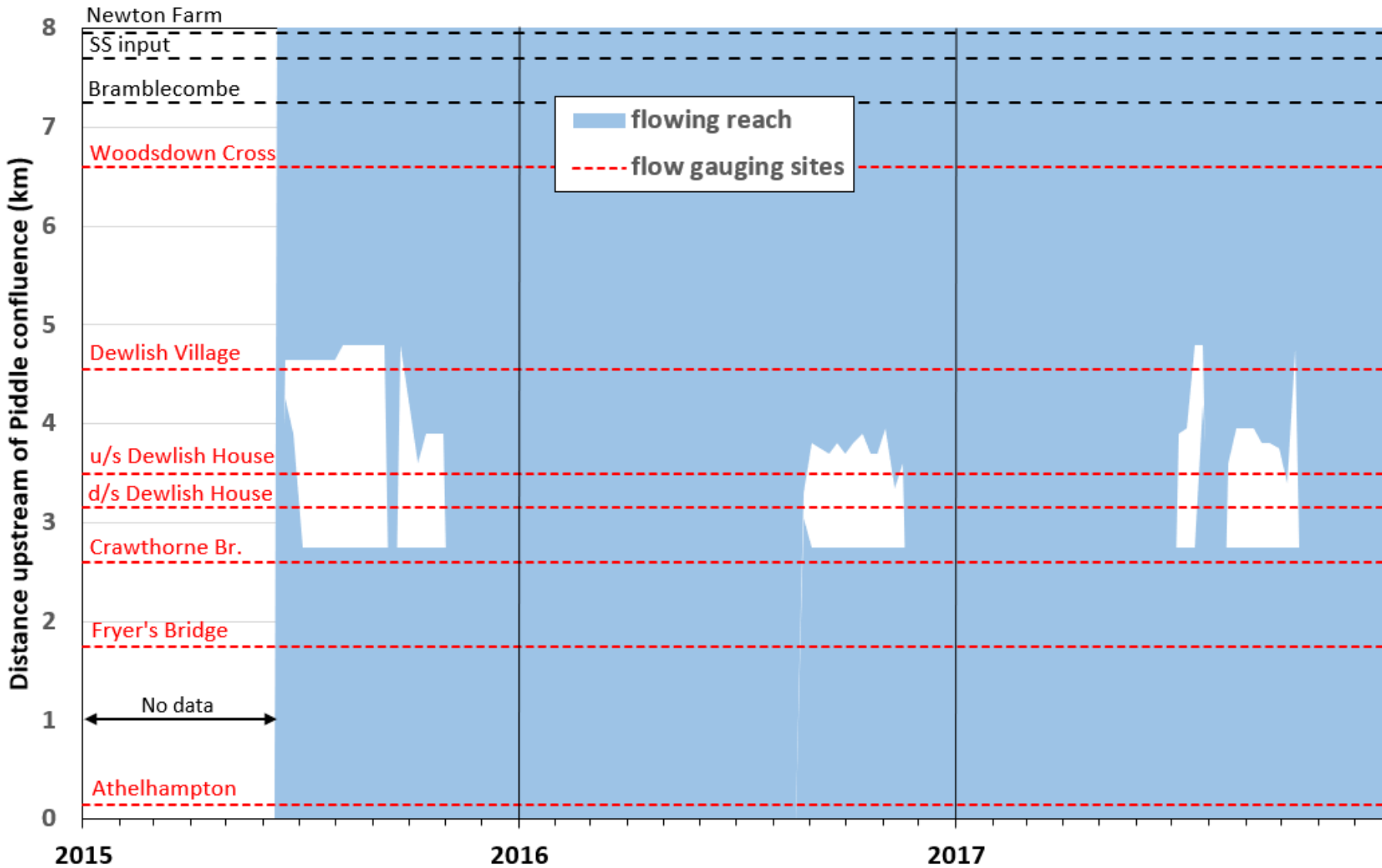
Legend

-  PCK – Portsdown Chalk Formation
-  SpCK – Spetisbury Chalk Member
-  TCK – Tarrant Chalk Member
-  NCK – Seaford and Newhaven Chalk Formation
-  SCK – Seaford and Newhaven Chalk Formation
-  LeCK – Lewes Nodular Chalk Formation

Upper Chalk

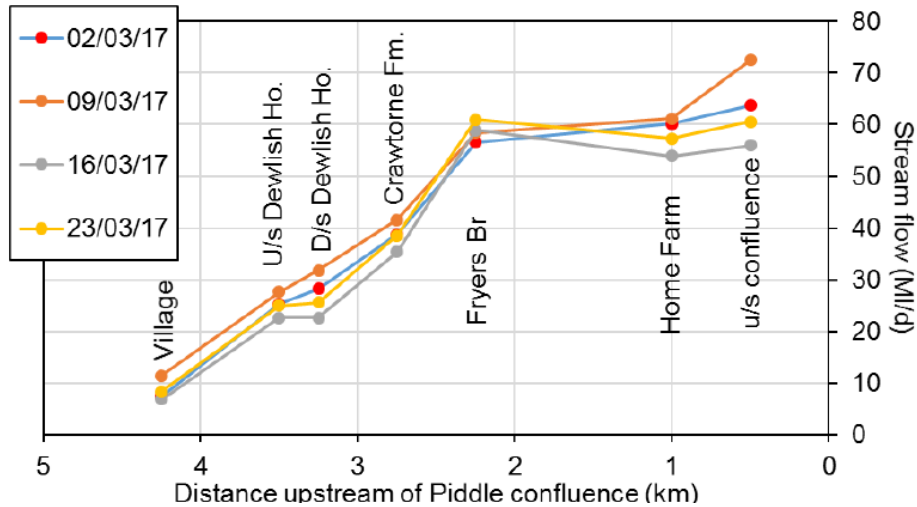
-  NPCK – New Pit Chalk Formation
 -  HCK – Holywell Nodular chalk Formation
 -  ZCK – Zig Zag Chalk Formation
 -  UGS – Upper Greensand Formation
- Middle Chalk
- Lower Chalk

Hydrology – winterbourne signature

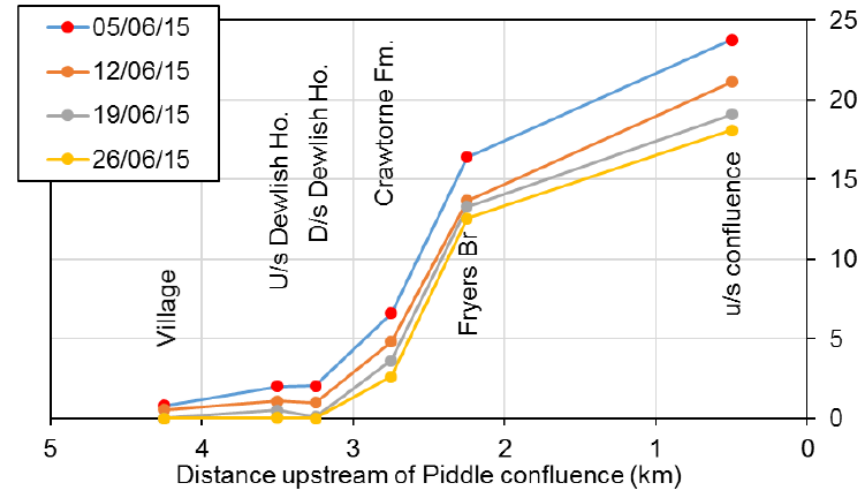


Hydrology – flow changes

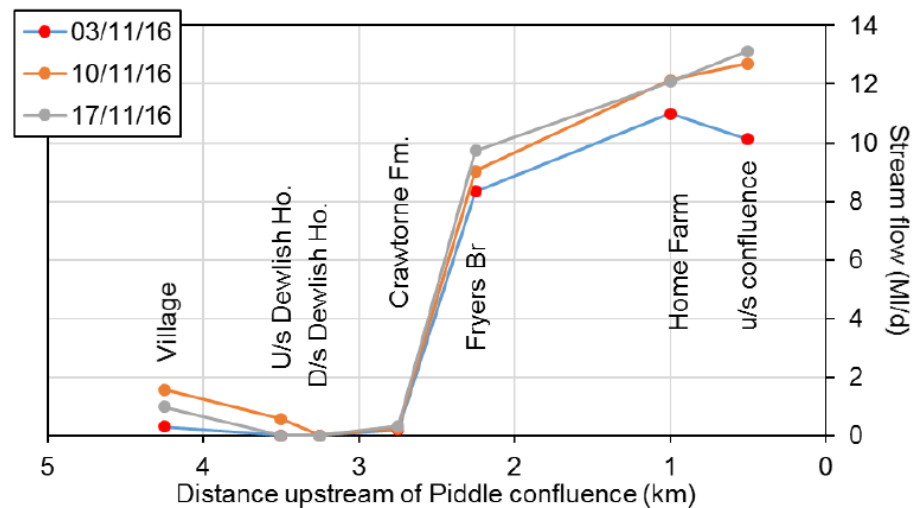
High flows




Medium flows



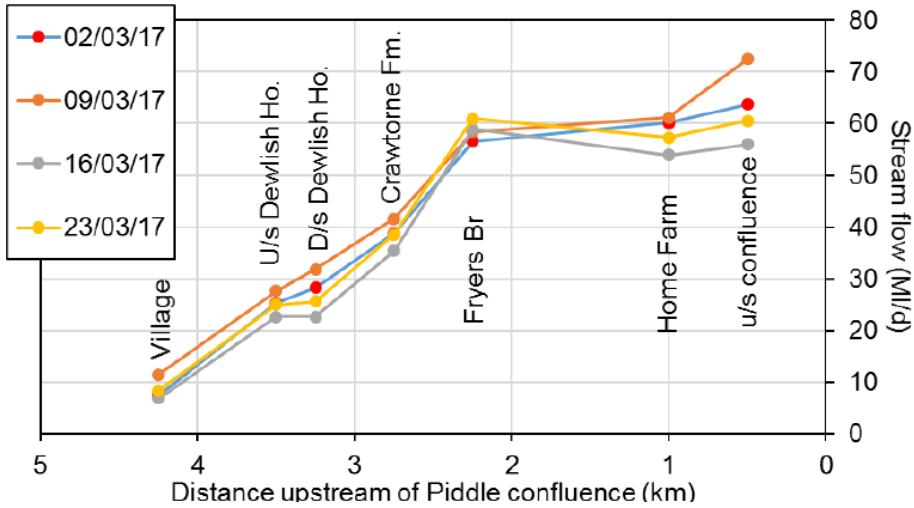
Low flows



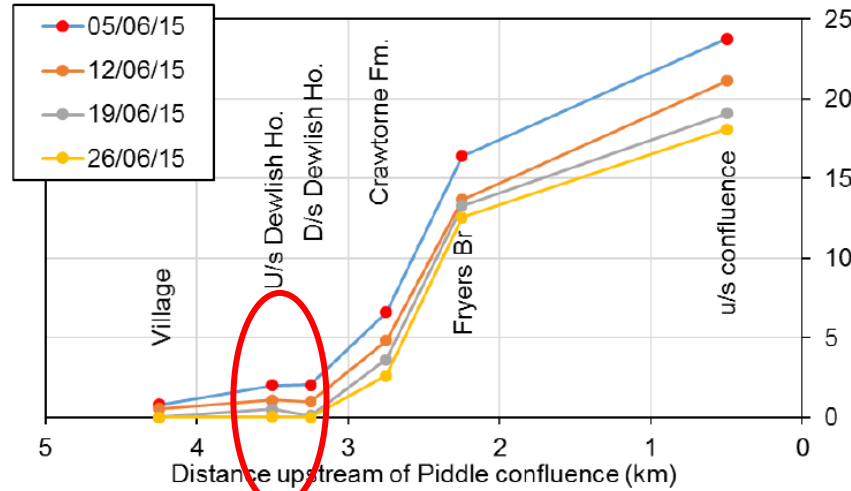
 Flow gauging sites

Hydrology – flow changes

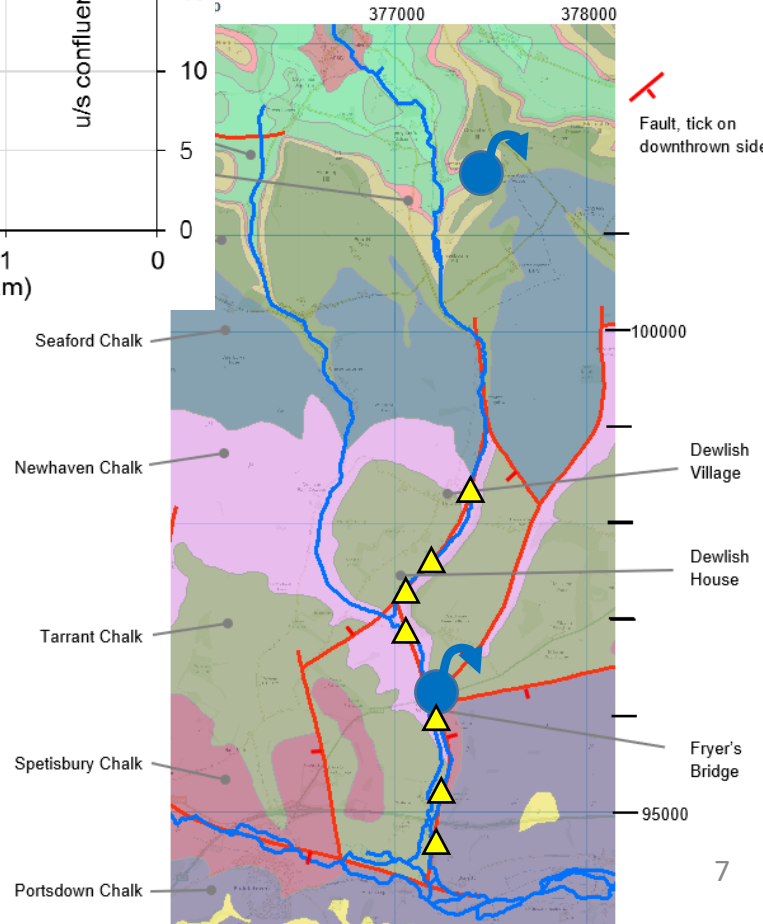
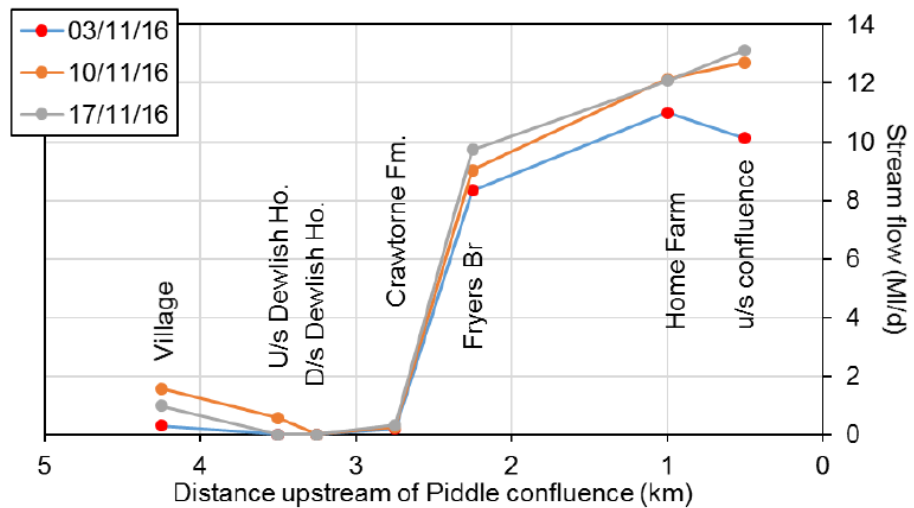
High flows



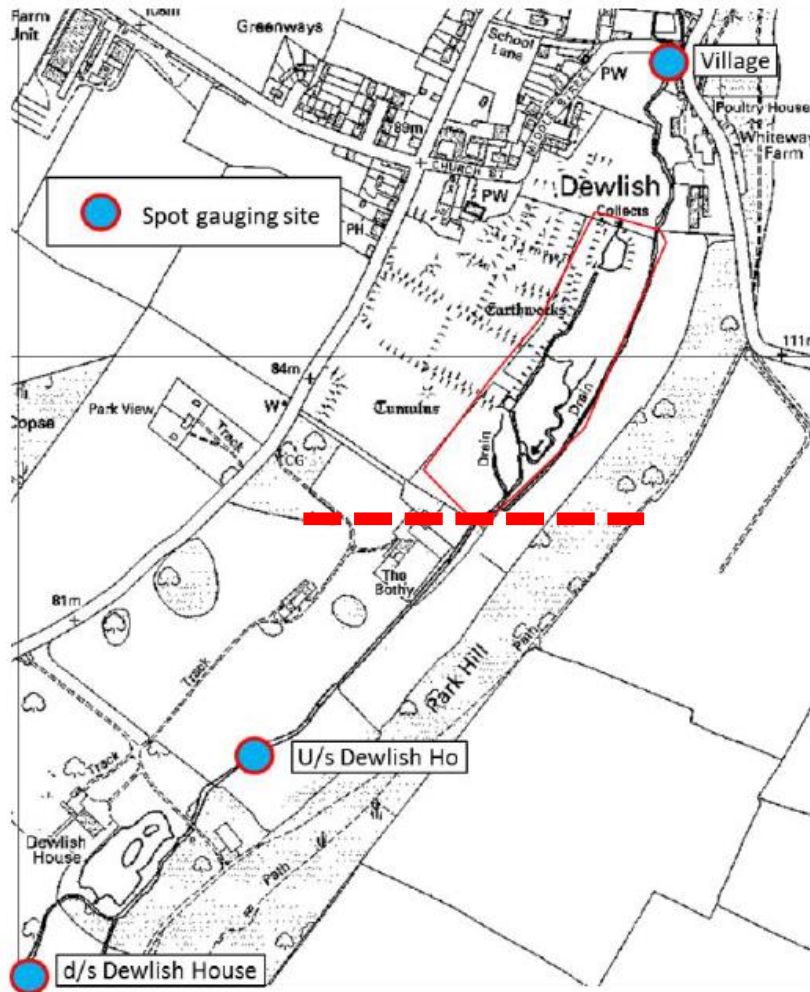
Medium flows

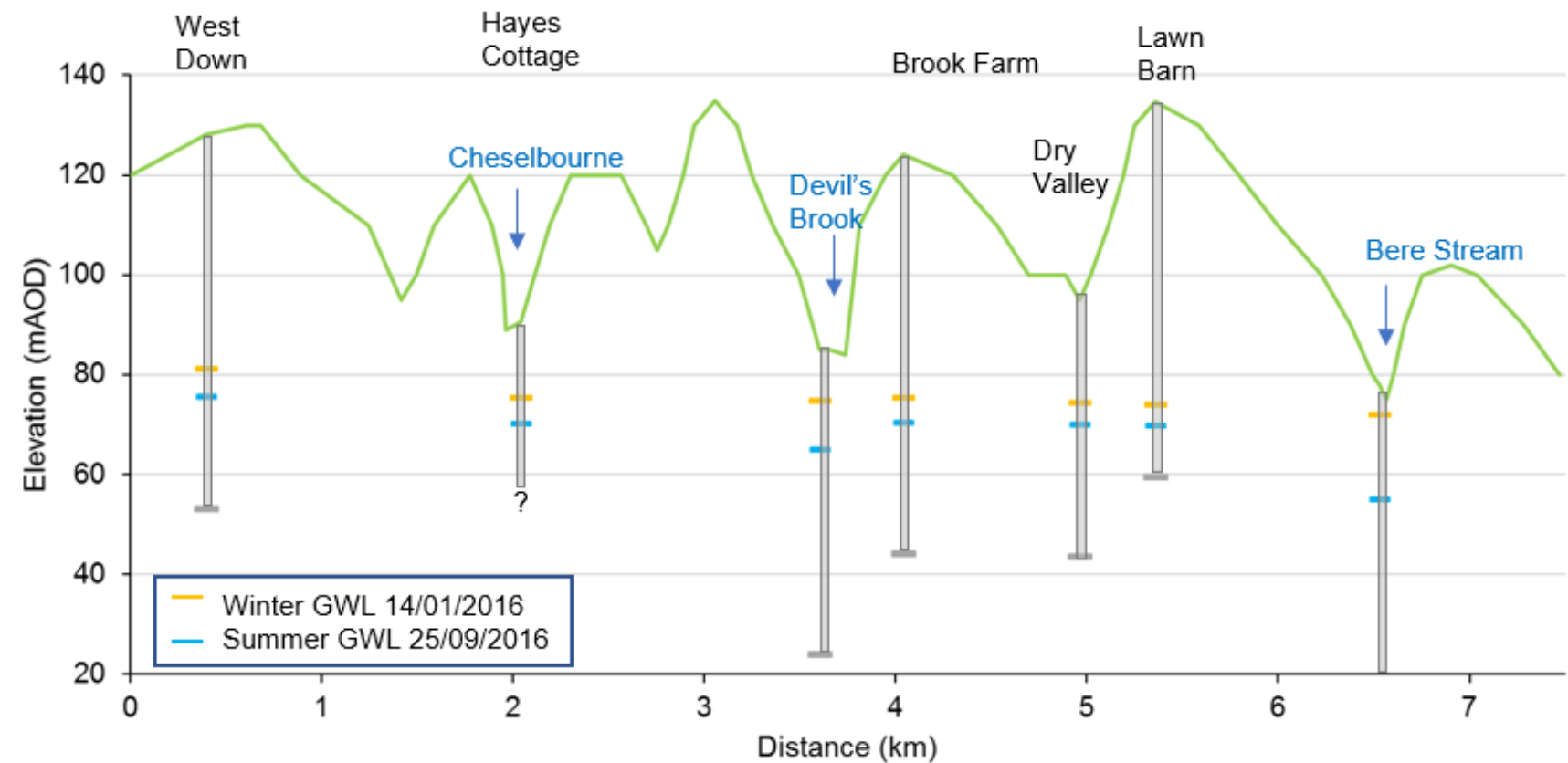
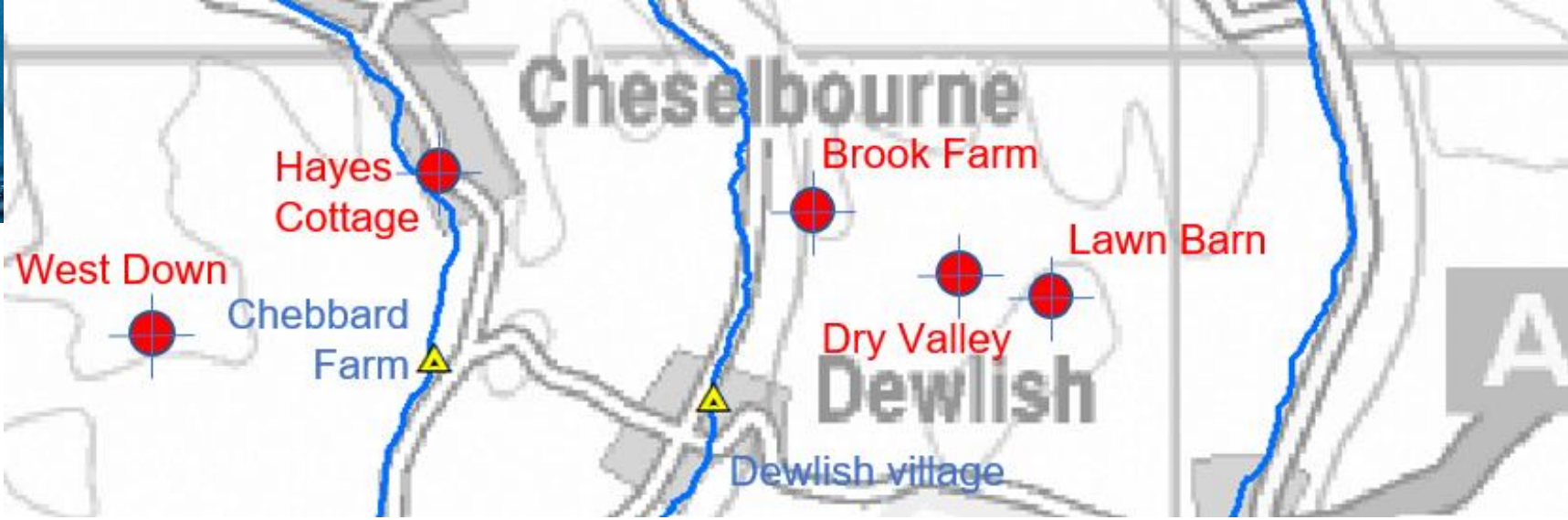


Low flows



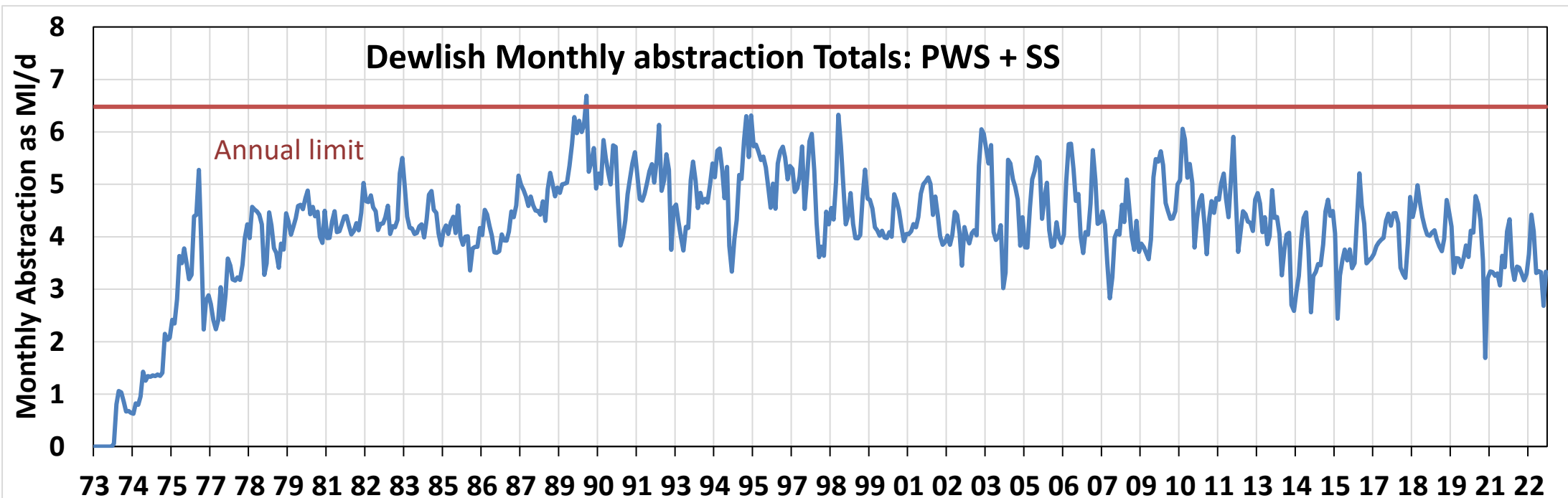
Hydrology – Church fault



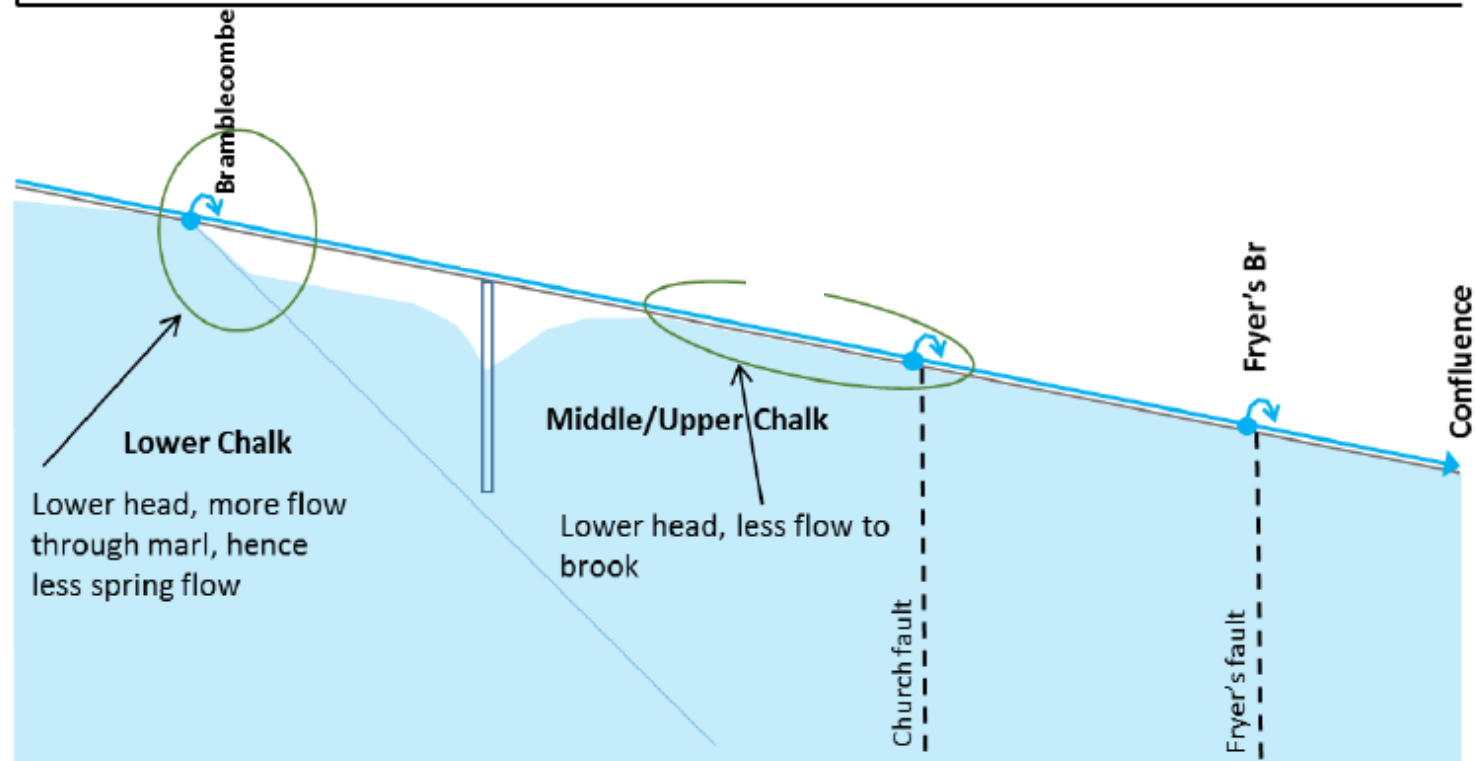
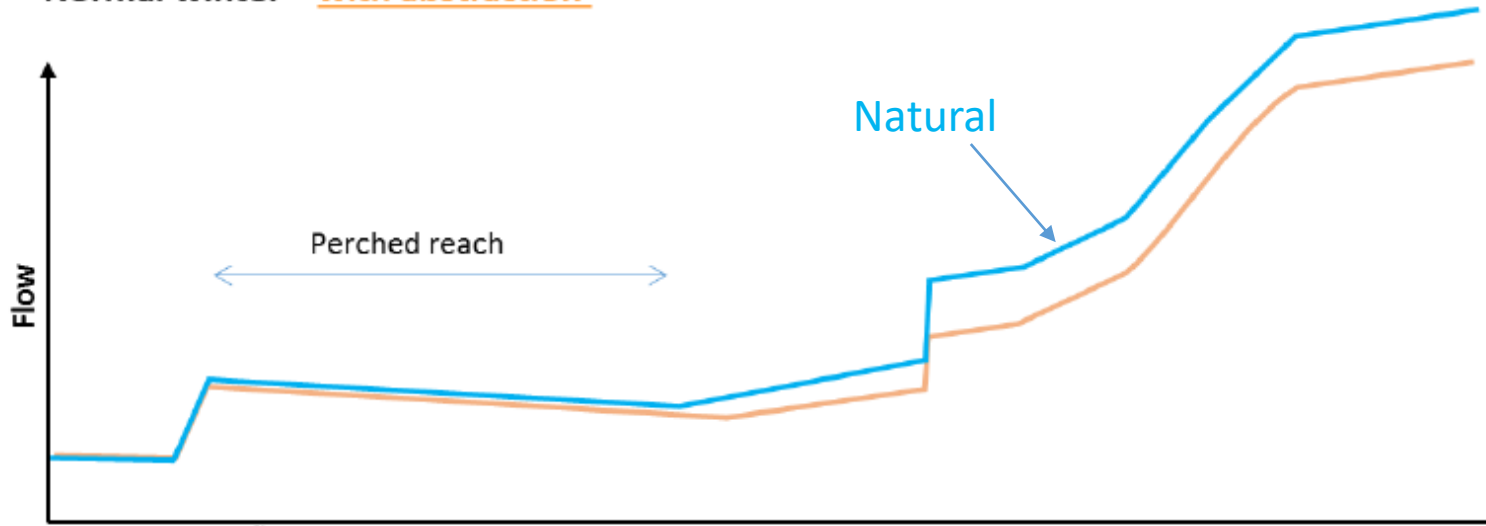


Dewlish PWS

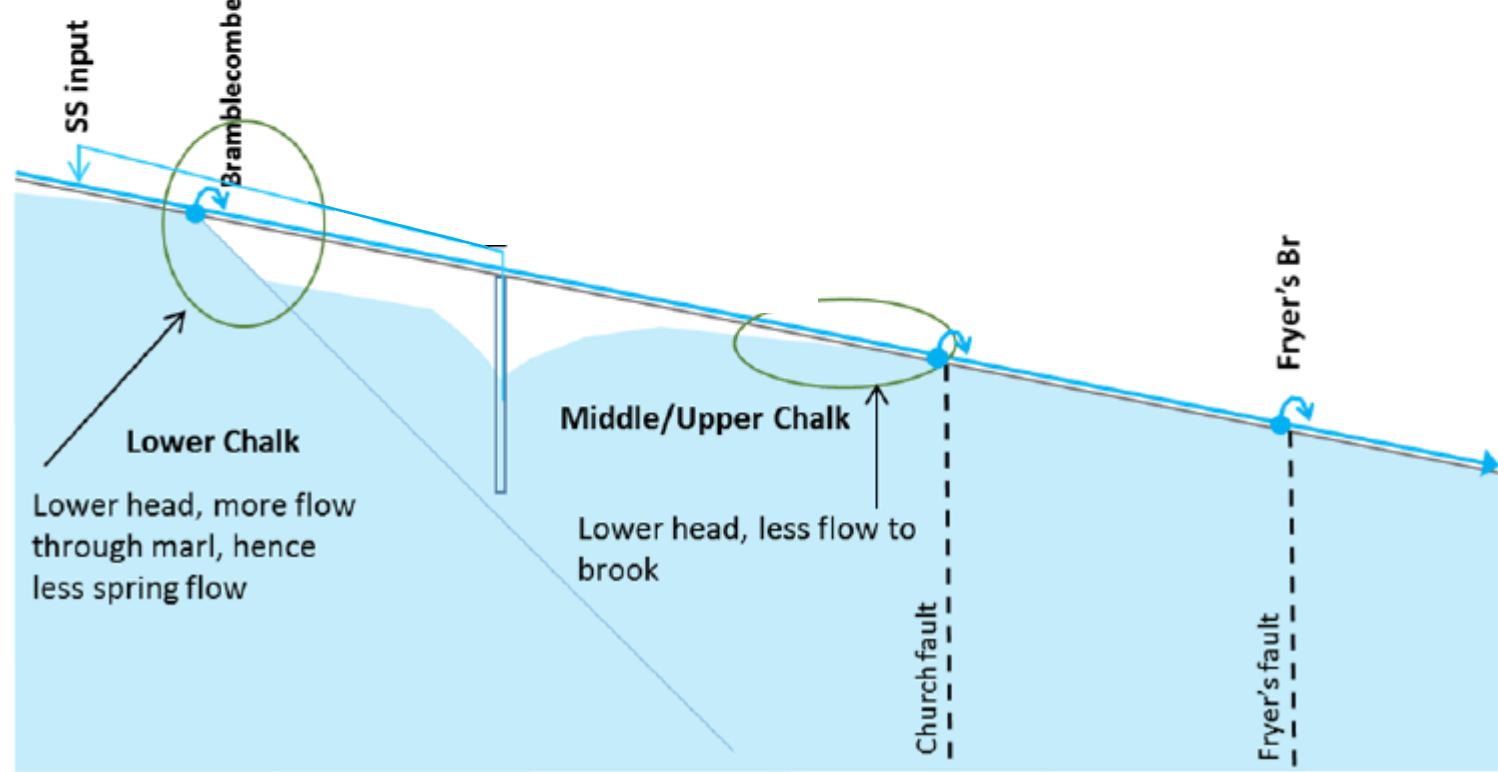
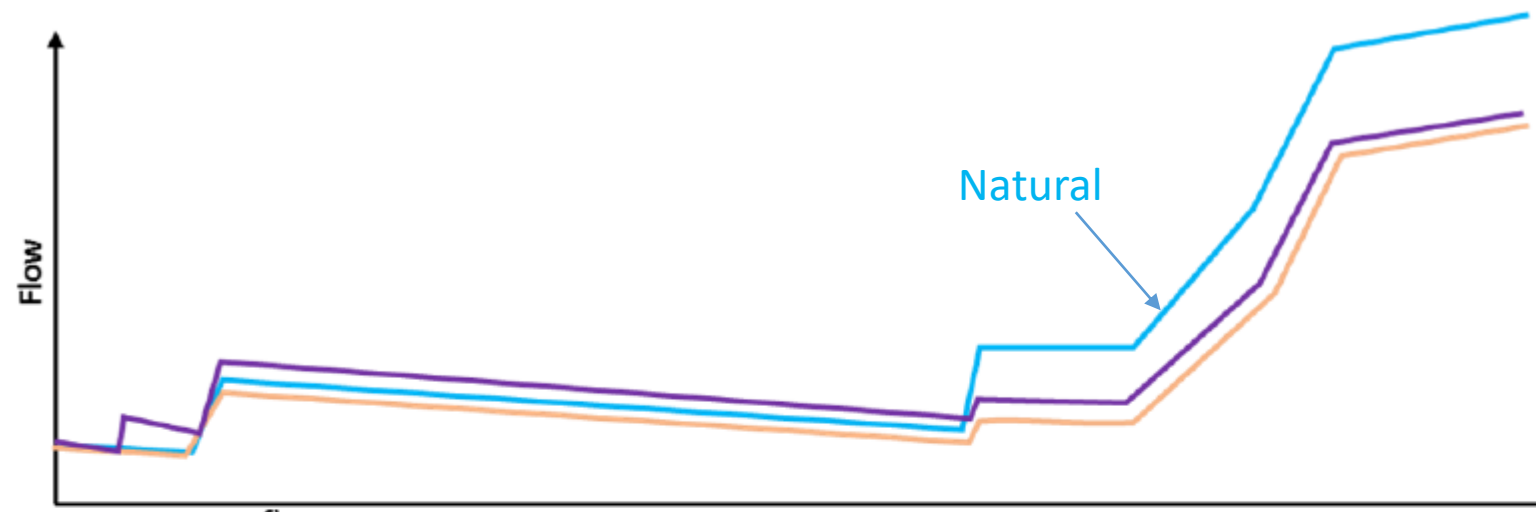
- Developed in the late 1960's
- Stream support used to mitigate impact
- Operational since 1973: 9.09 MI/d (PWS+SS)
- Annual 2363.966 MI (=6.48 MI/d)



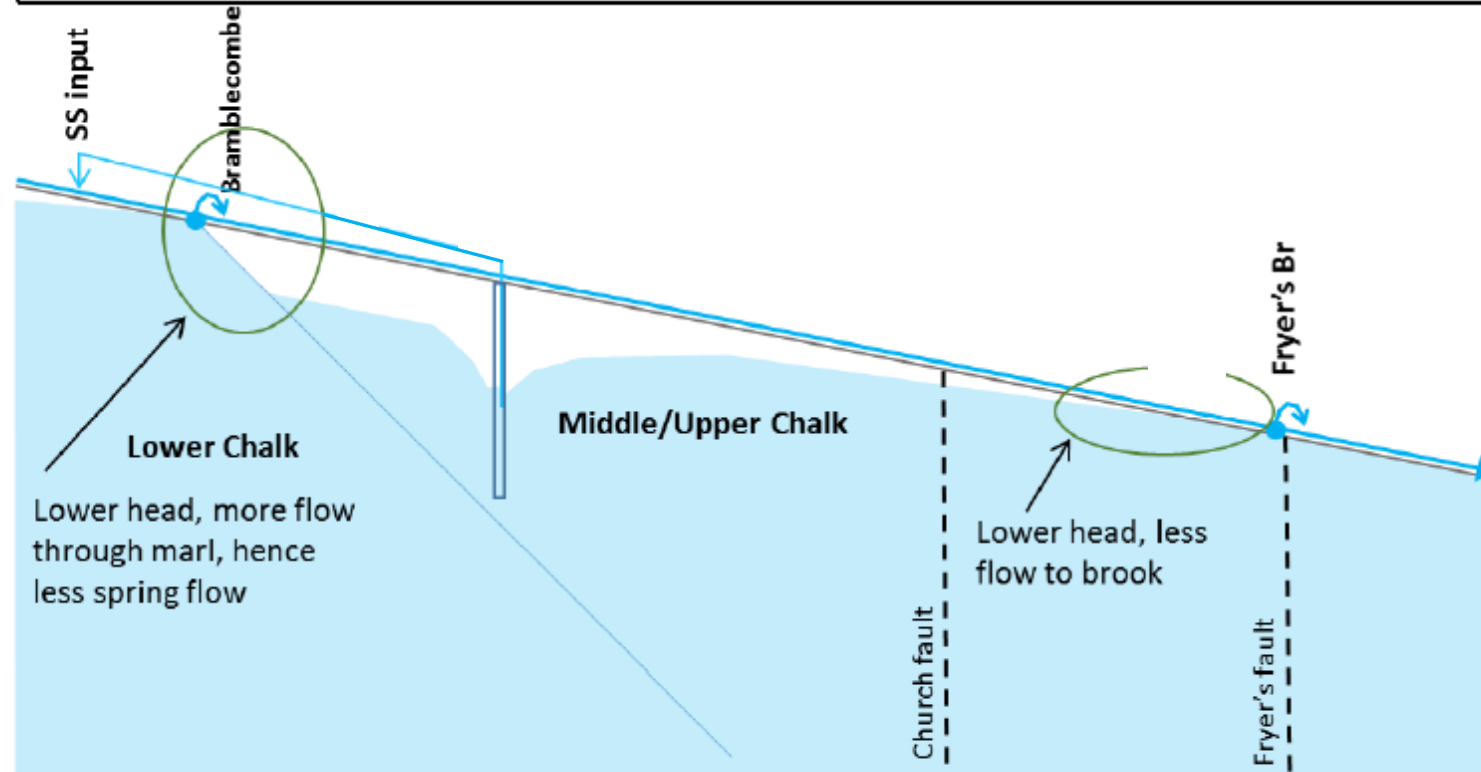
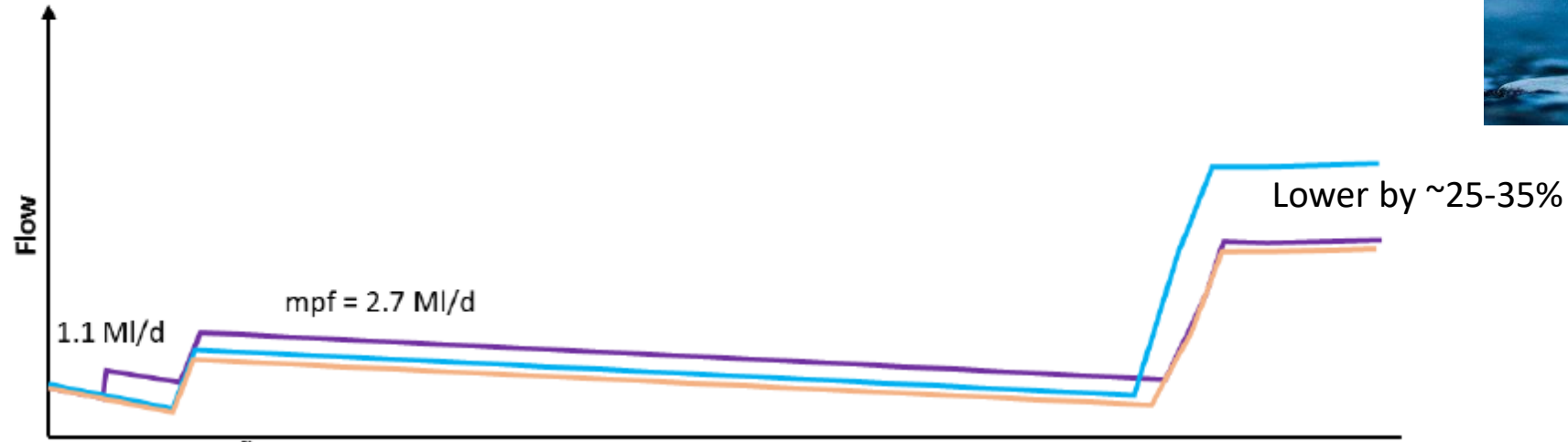
Normal winter – with abstraction



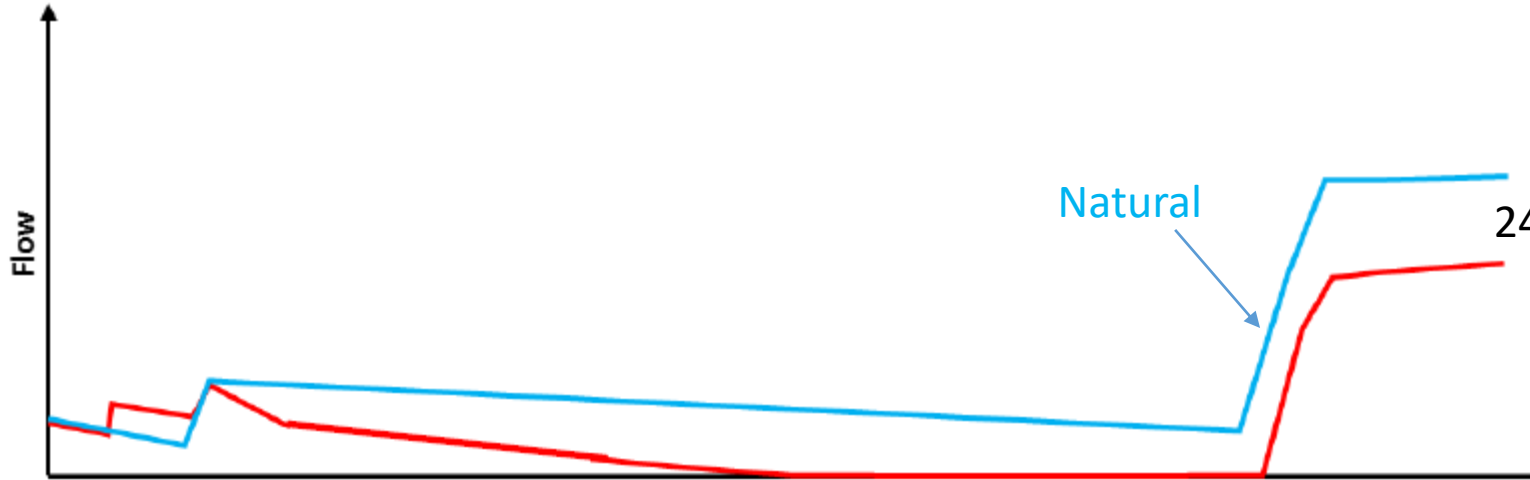
Spring – with abstraction and with mitigation



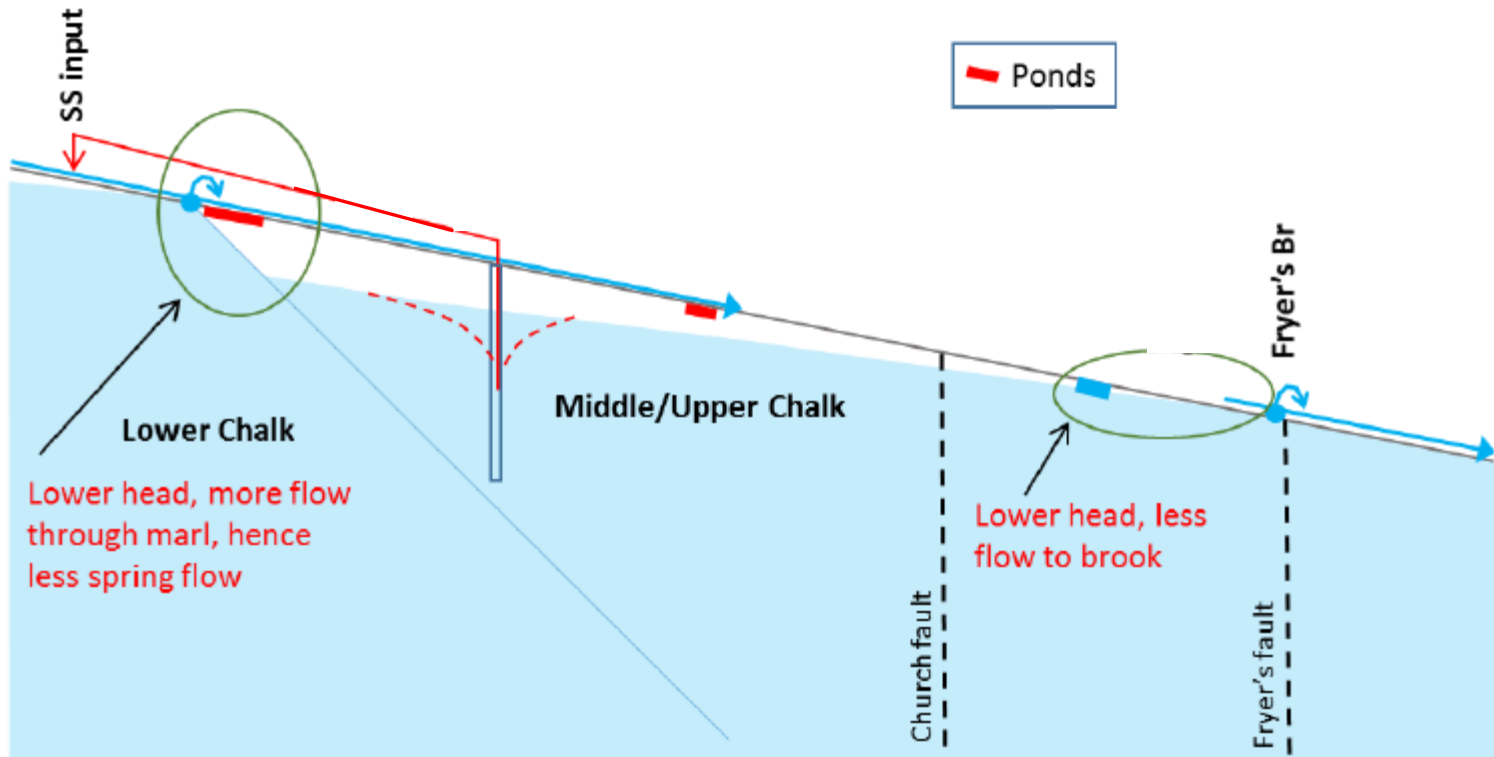
Summer – with abstraction and with mitigation



Summer Pre1972 and Post 1972



24% lower Recent Use : 35% at full licence



- Perennial reach
- WFD status
 - Plants - Good/Moderate,
 - Macroinvertebrates - High/Good
 - Fish – Bad
 - Low diversity – only trout, bullheads and lamprey
 - Trout number comparable to other chalk streams



Why?

- No barriers
- Habitat suitability?
 - Lack of marginal and channel complexity



Subsequent Actions

- Pending licence change
 - Summer total (PWS and SS) to be limited to 6.09 MI/d, down from 9.09 MI/d
 - Effectively limits summer PWS to 5 MI/d
- River habitat improvement – downstream of Crawthorne
 - Installed autumn 2022
 - Deflectors
 - Fencing



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