

Poole Harbour Habitat Creation Scheme – The Moors at Arne

Ridge - Drainage and groundwater - Interim Evaluation

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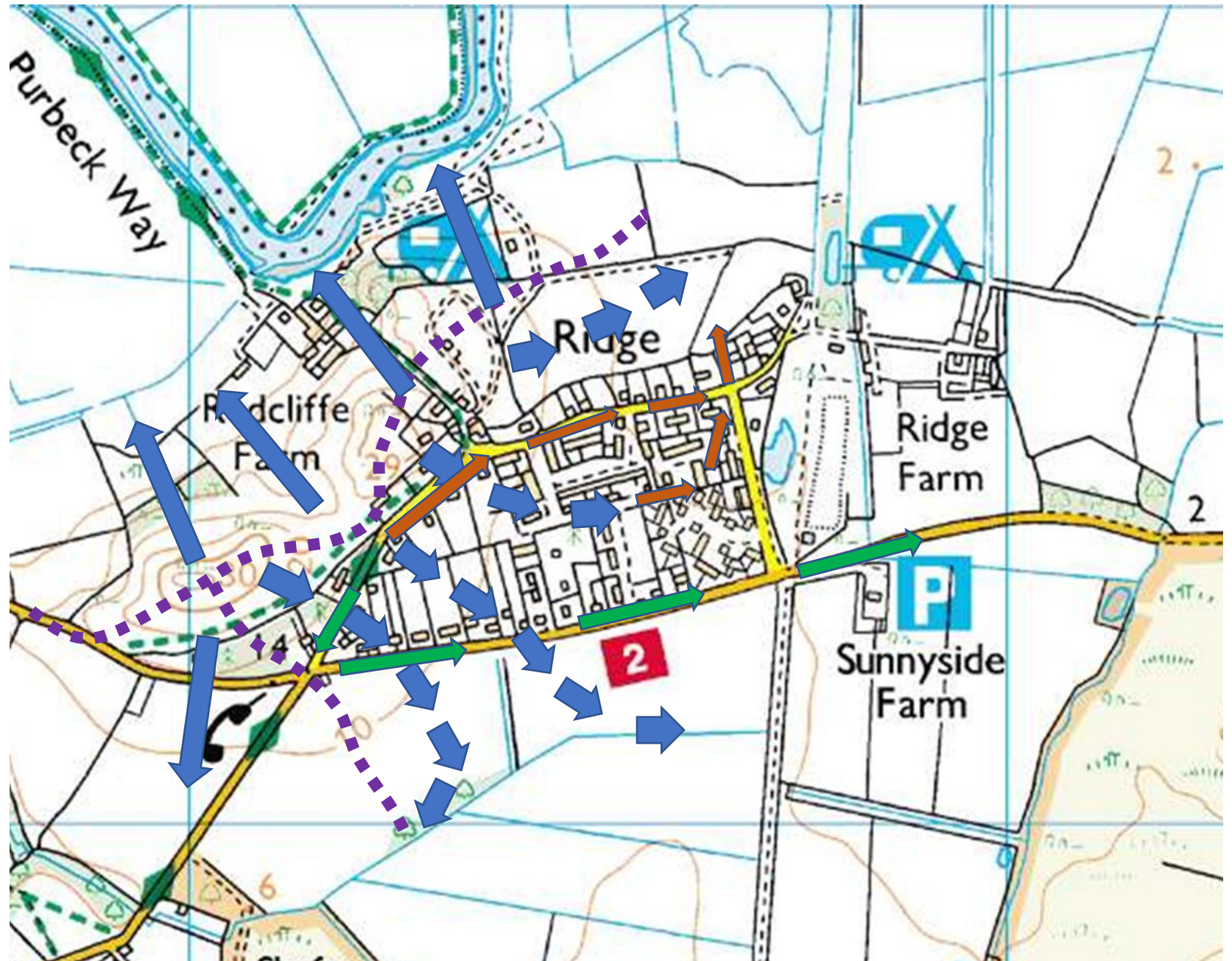
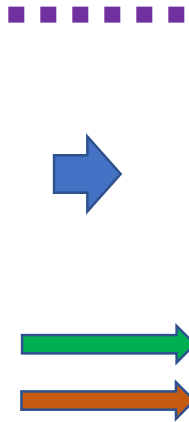
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Introduction and objectives

- This presentation is intended to set out our current understanding of drainage and groundwater beneath Ridge and the relationship these may have with our proposed scheme
- We have adapted and developed our investigations according to concerns raised by the community
- This presentation offers a review of the work carried out and represents an insight into our studies and site investigations to date
- We are continuing to gather data and our interpretation may be expected to evolve further






Surface Drainage

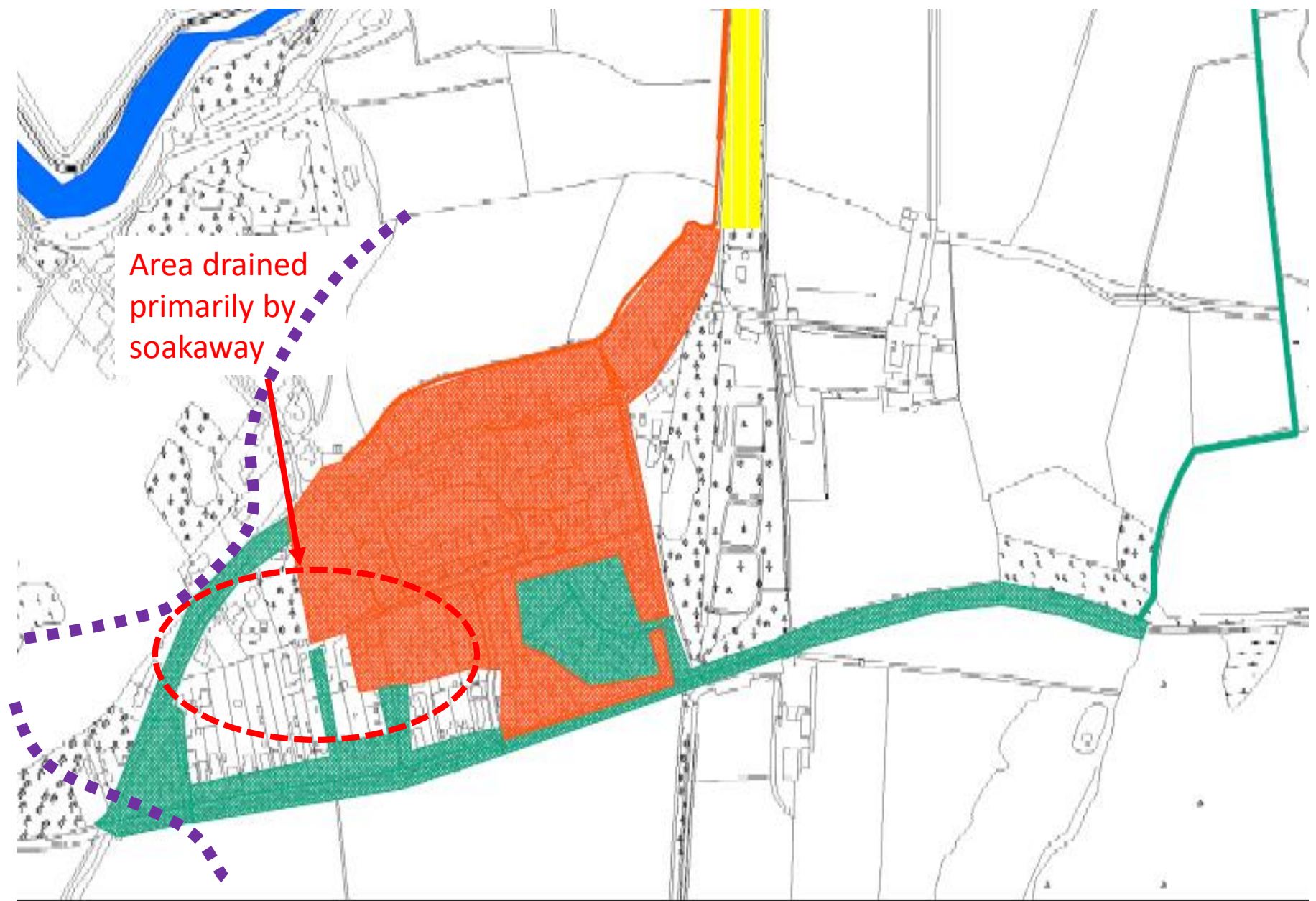
- Hydrological catchment
- Natural “off slope” drainage
- Surface water drainage impacts/ intercepts natural overland flow



Surface water drainage catchments

- Road and roof drainage
- Soakaways to western part at top end of SW catchment
- Soakaways capture surface water runoff and recharge underlying shallow aquifer

	Boundaries of rainfall runoff catchments, indicating break of slope
	Area of made ground acting as a barrier
	Area connected to systems which drain to the North
	Area connected to systems which drain to the East
	Soakaways capture surface runoff from roofs and paved areas feeding water into the ground



Hydrogeology - Regional perspective

- Poole Formation - minor aquifer
- Succession of interbedded sands and clays, variable thickness and depth
- Recharge across outcrop to south and within the upper catchment of the Furzebrook
- Discharge northward toward Poole Harbour
- Clay layers “confine” lower parts of the sand aquifer such that water in the lower parts is under pressure
- When clays are “punctured” by boreholes, water under pressure rises to surface

Parkstone Sand

Broadstone Clay

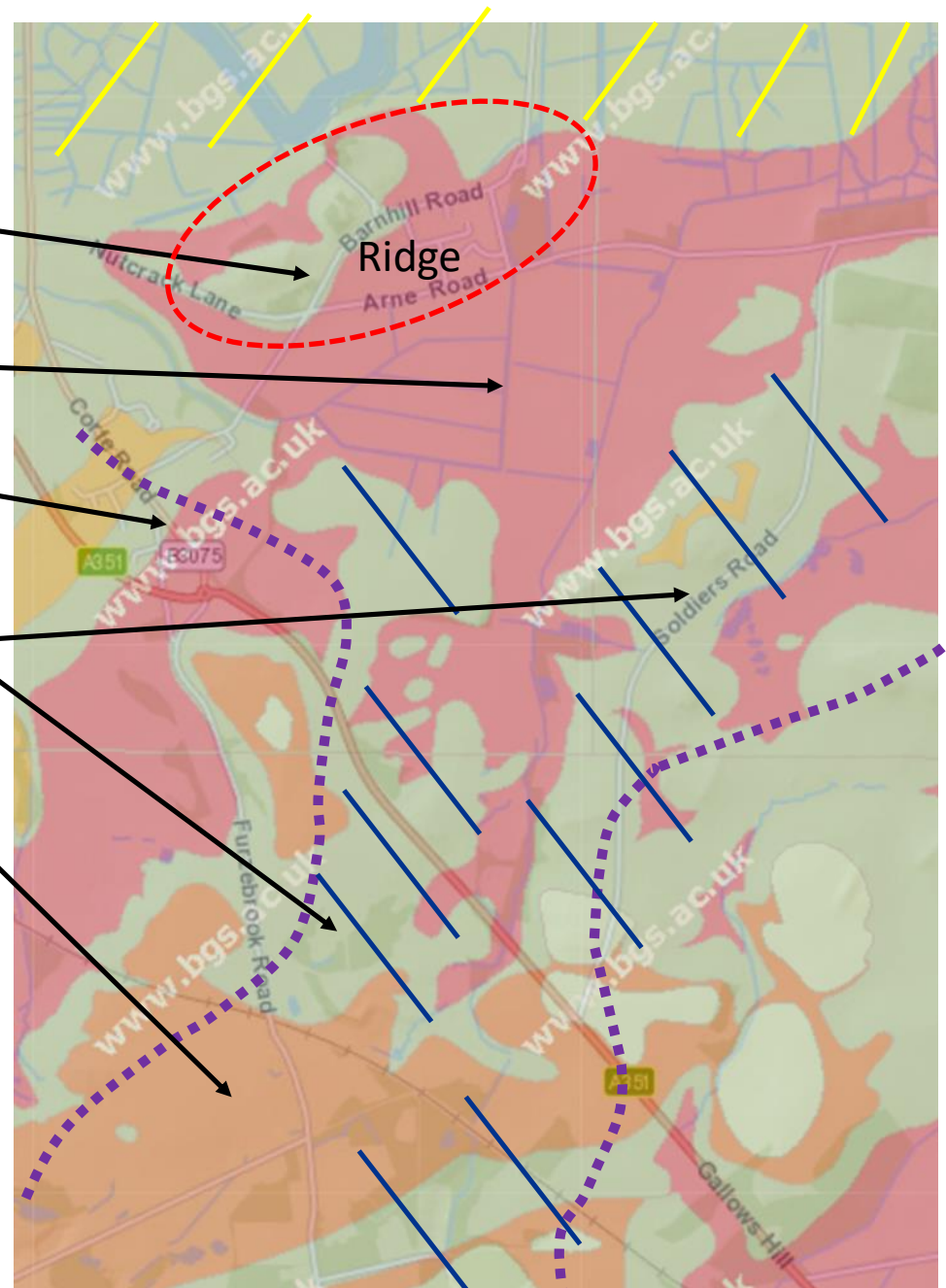
Broadstone Sand

Parkstone Sand

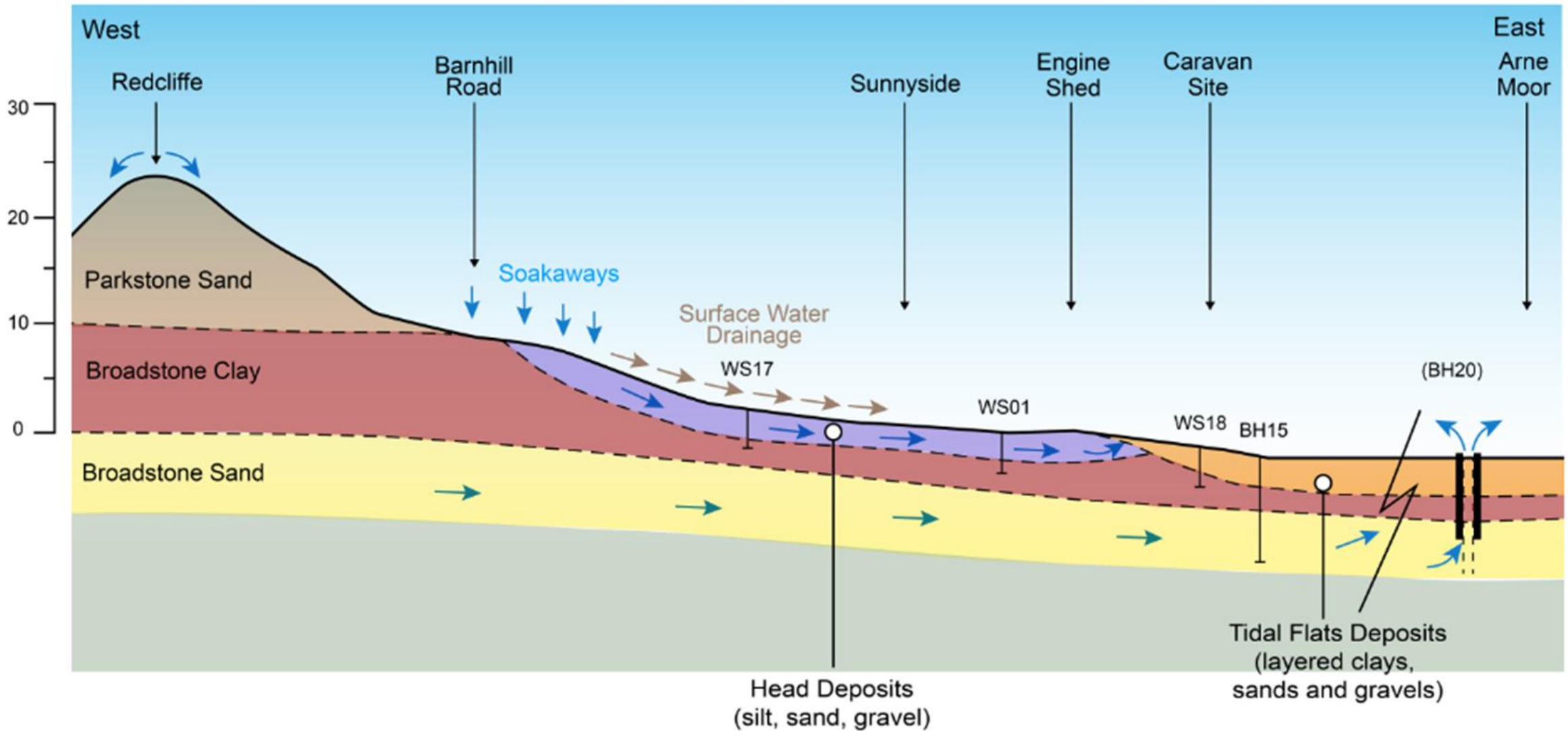
Parkstone Clay

Recharge area

Discharge area



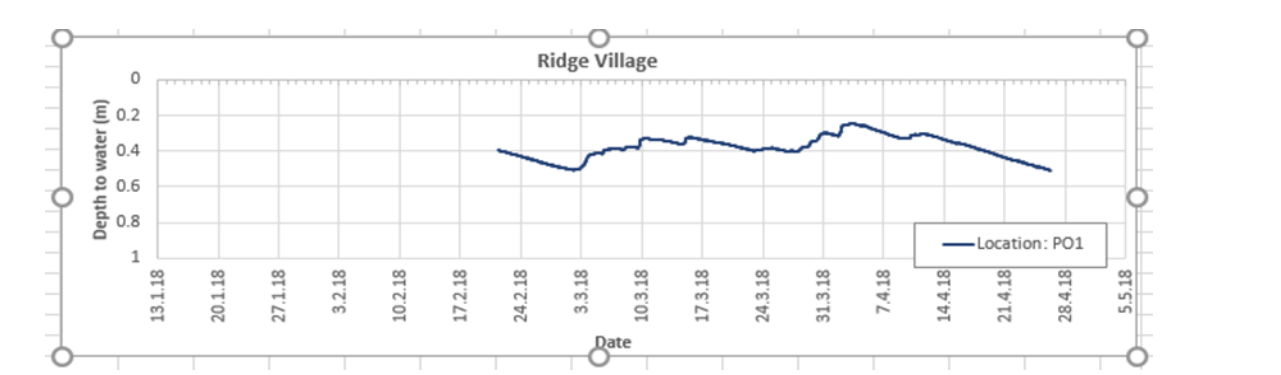
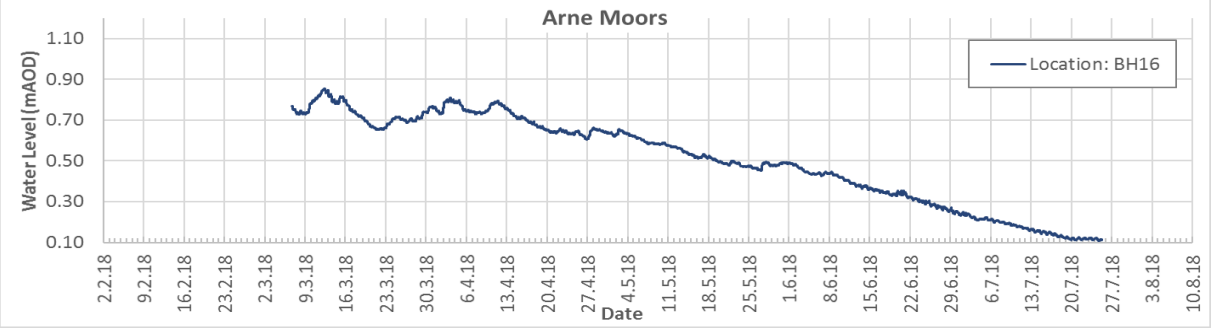
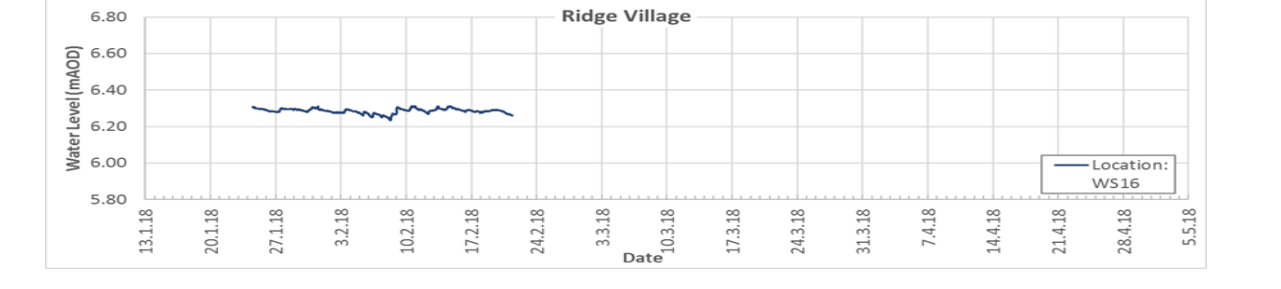
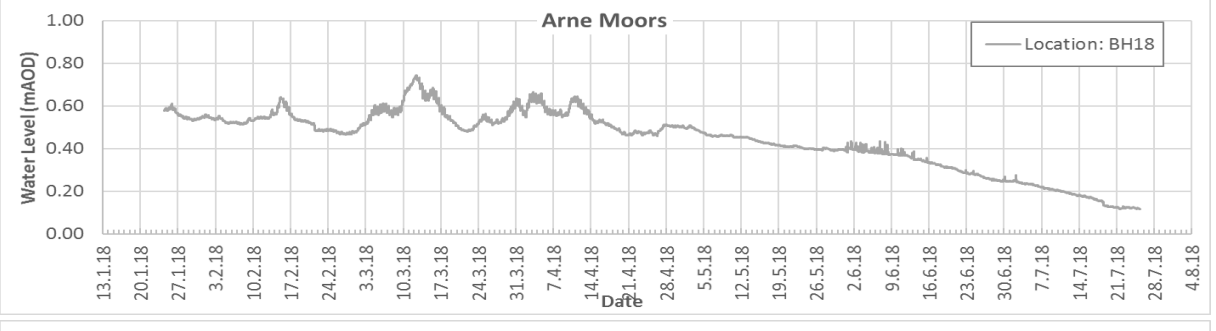
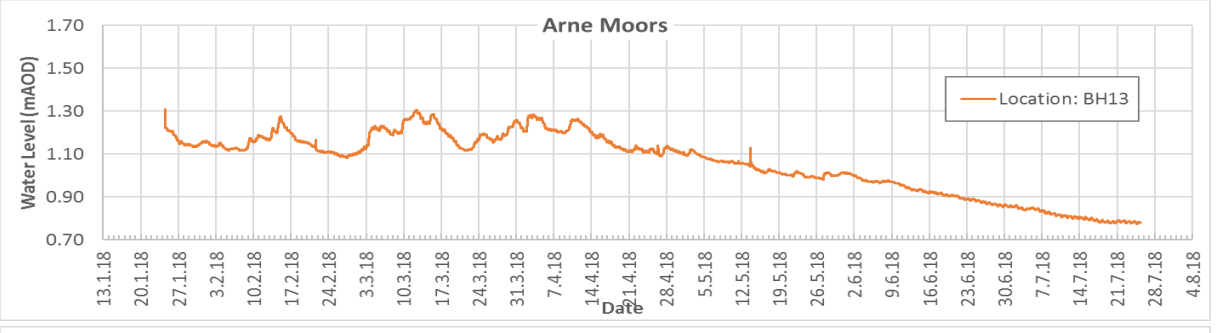
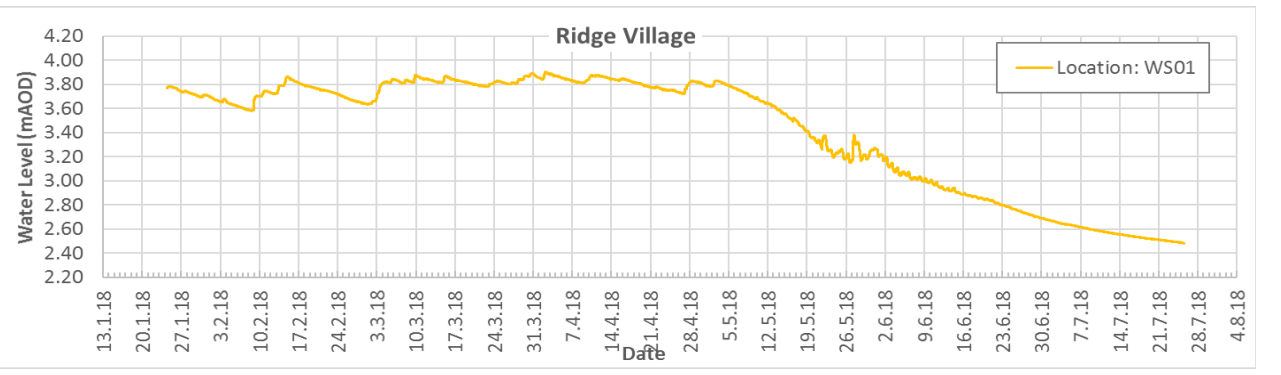
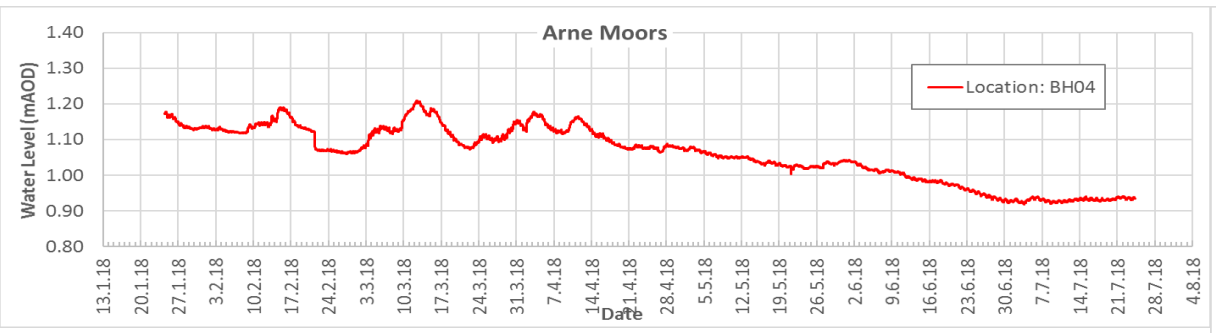
Groundwater - initial conceptual understanding (schematic section)

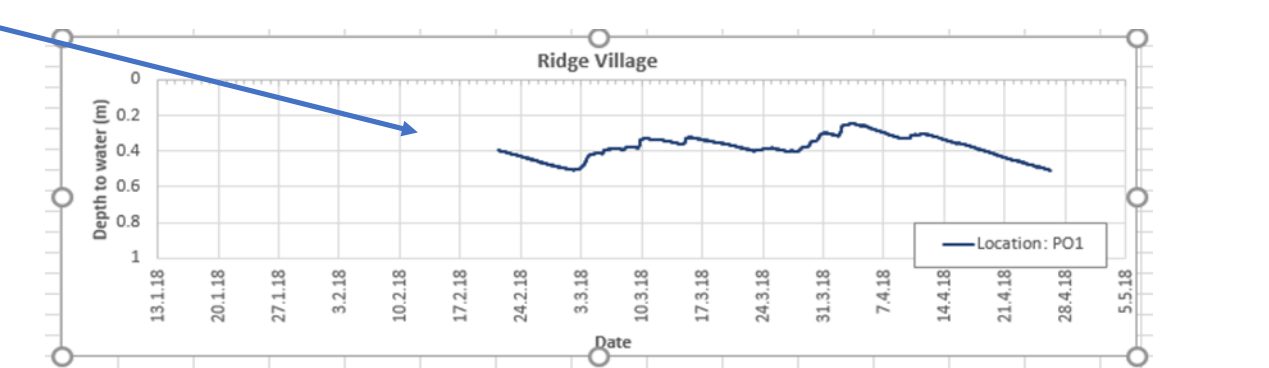
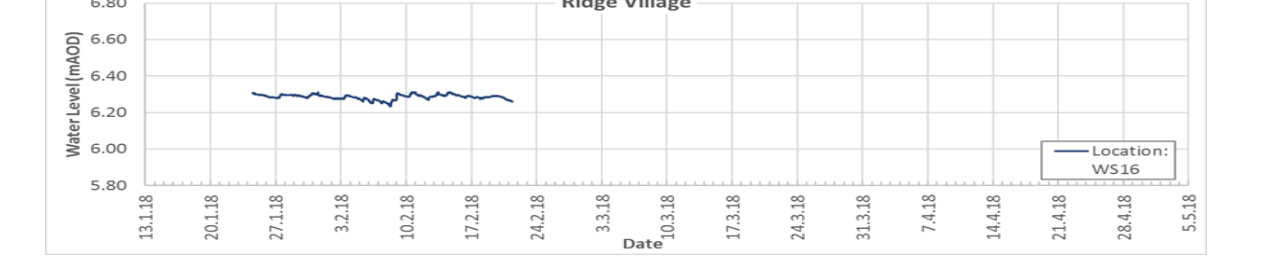
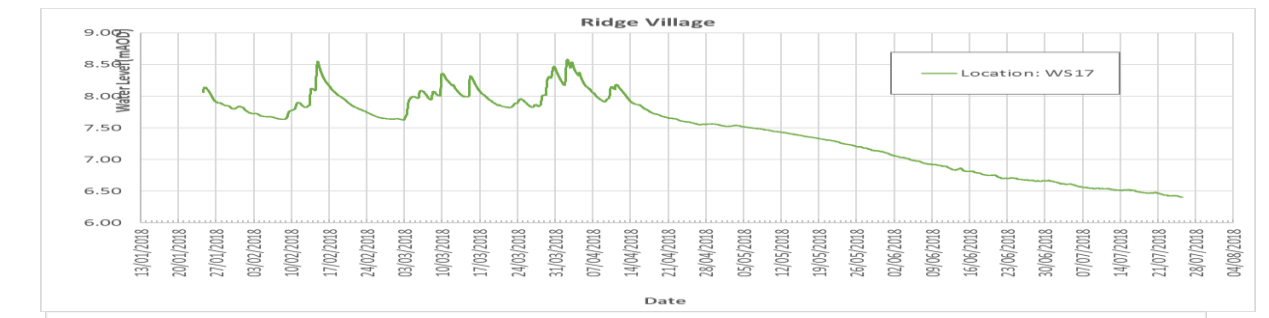
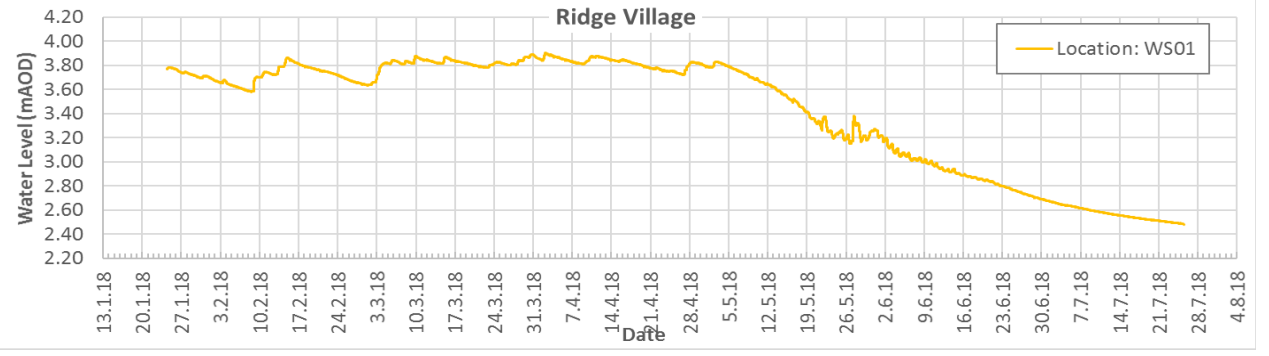
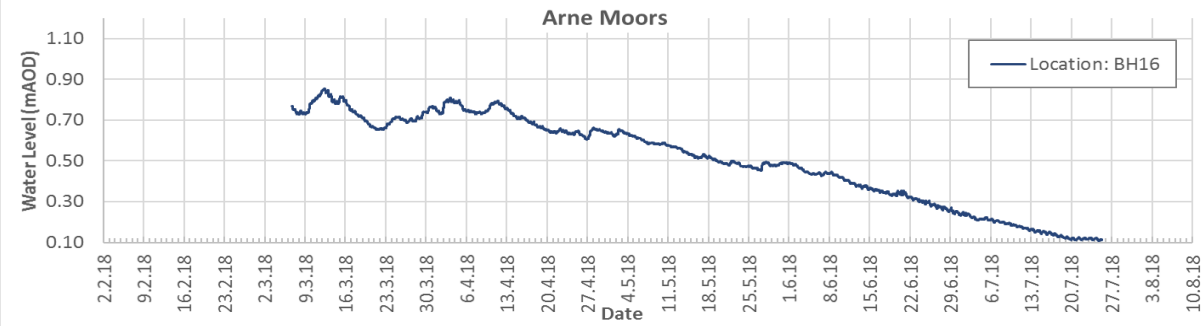
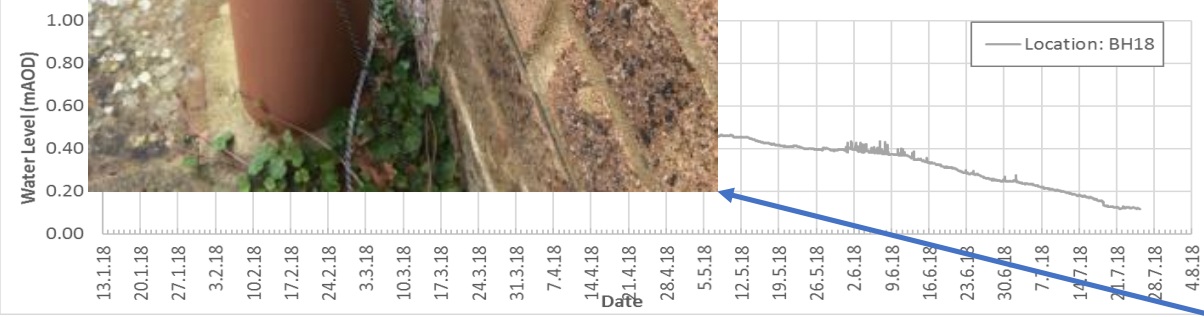
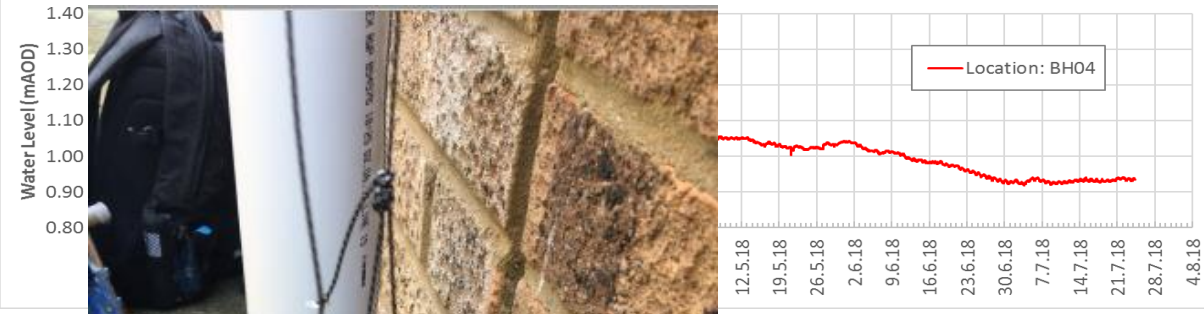


Ground Investigation - Monitoring well locations



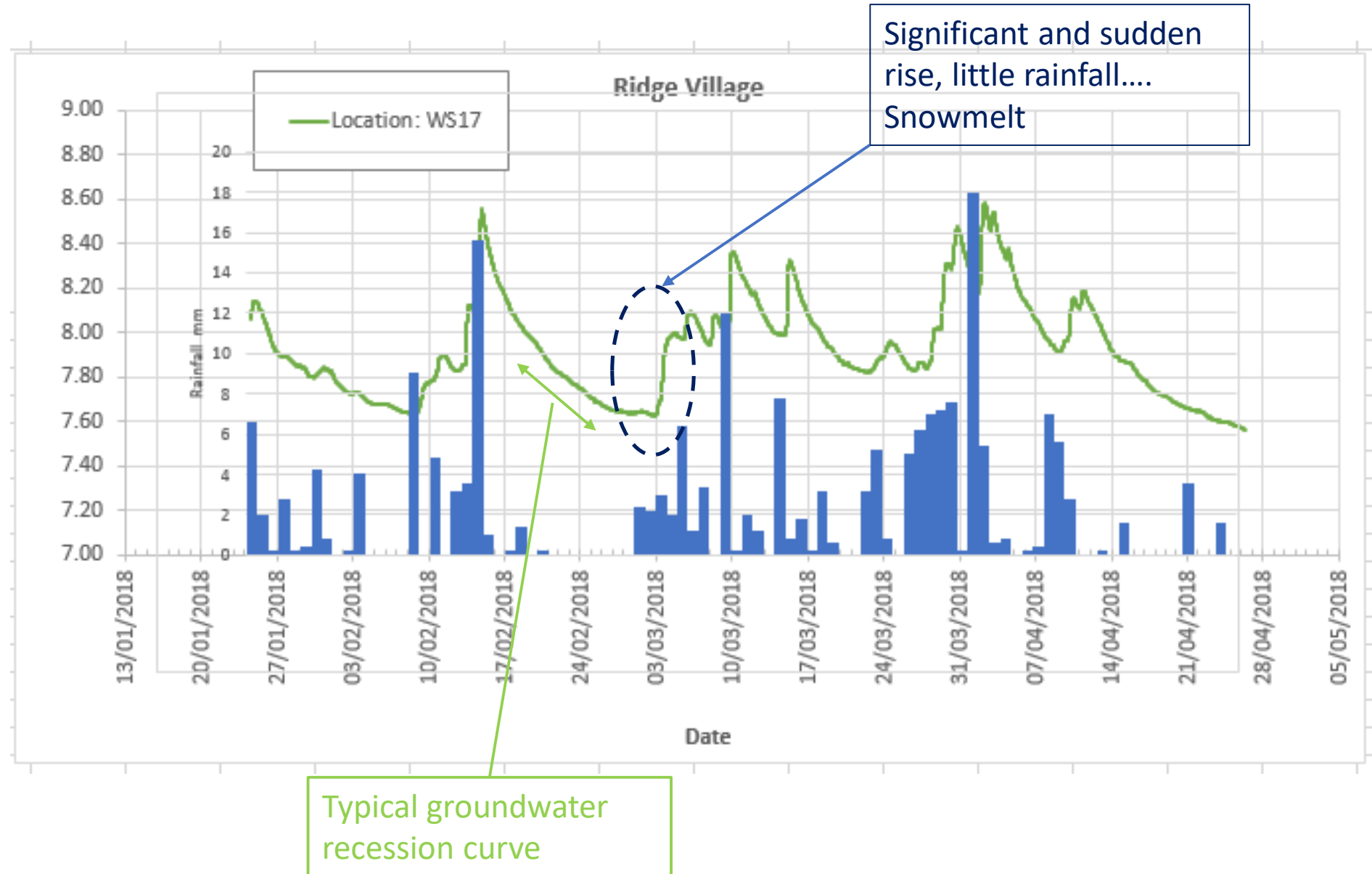
Installed water level loggers





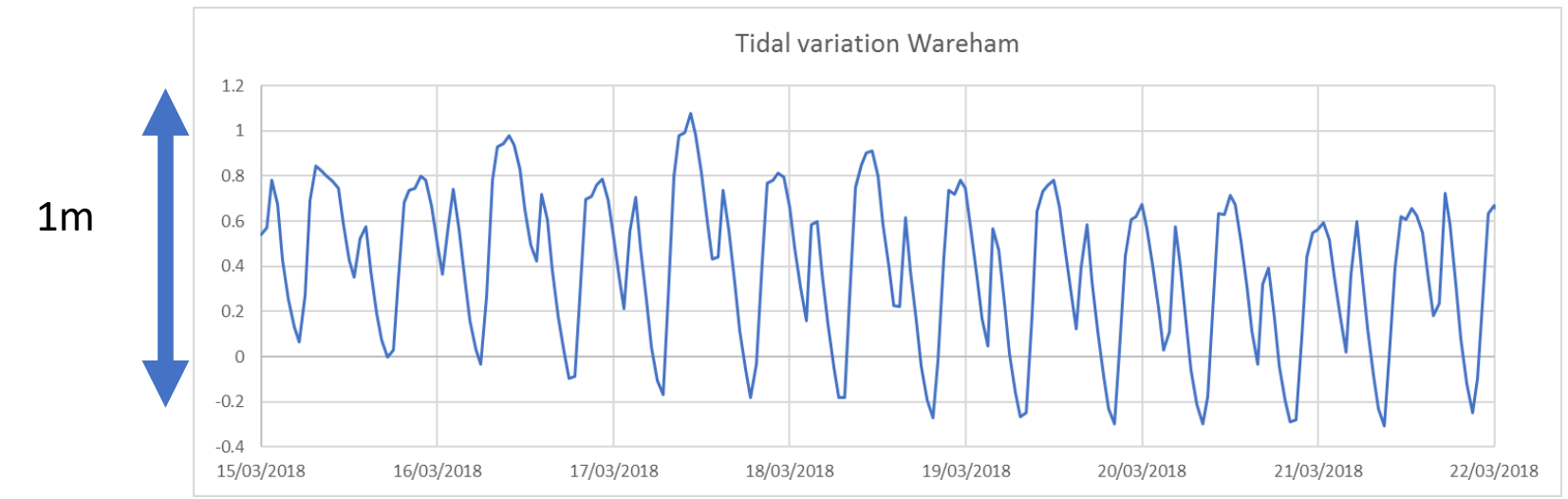
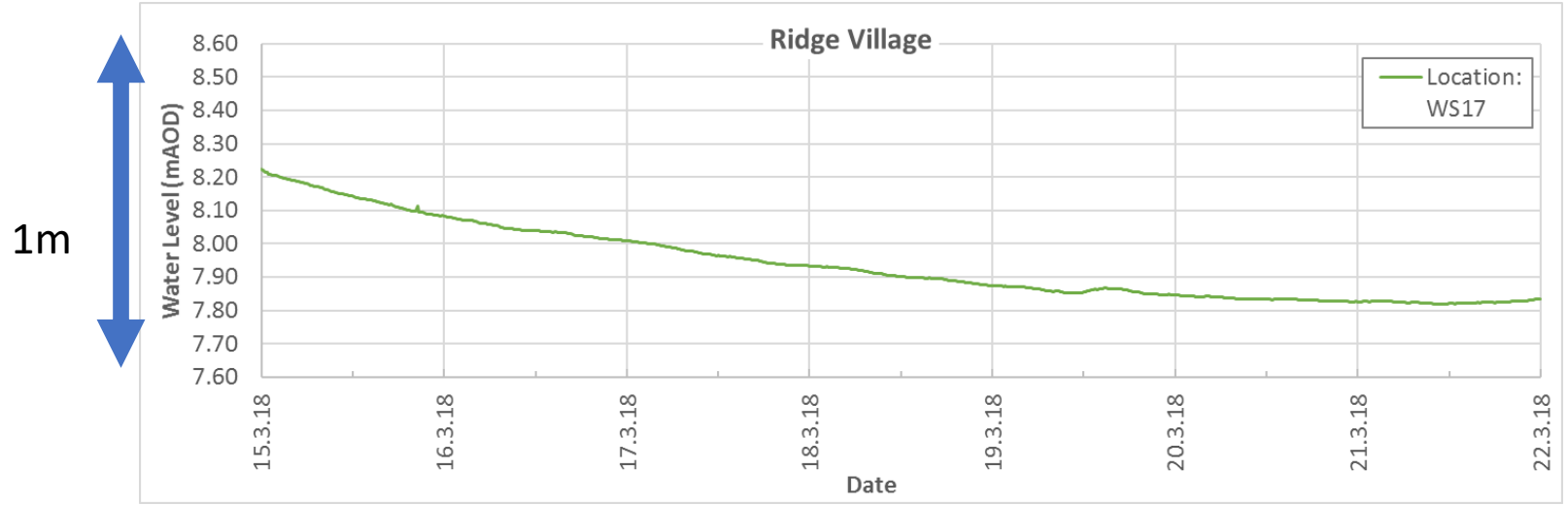
Well Hydrograph Ridge vs Rainfall (mm)

- Smaller rainfall events (< c.5mm) little impact
- Larger or cumulative events. Rapid response in groundwater levels



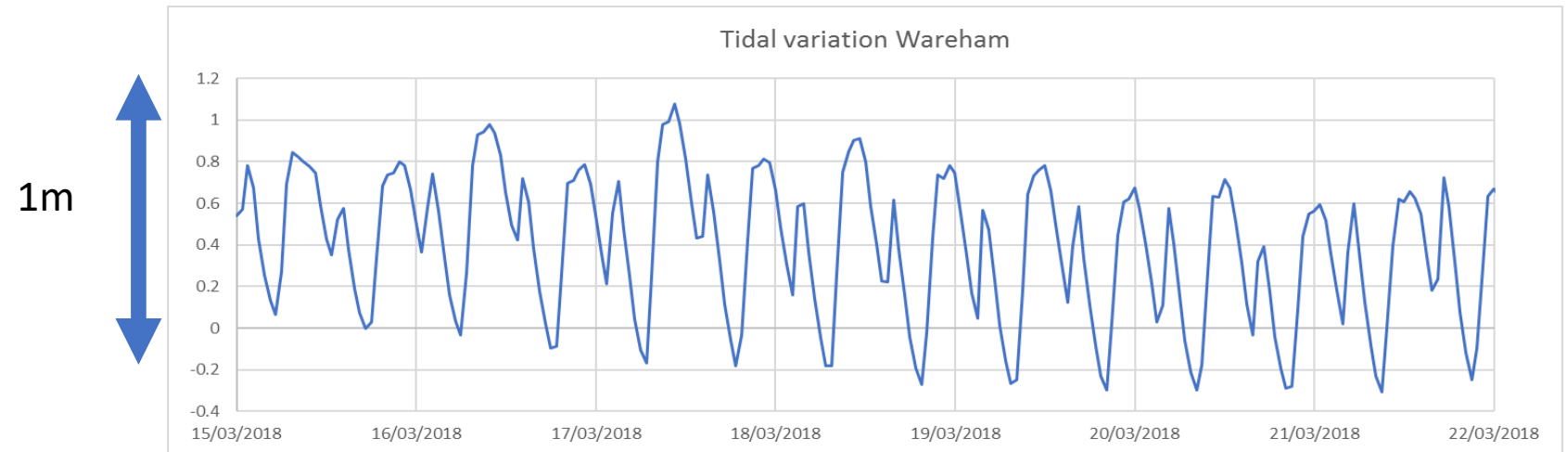
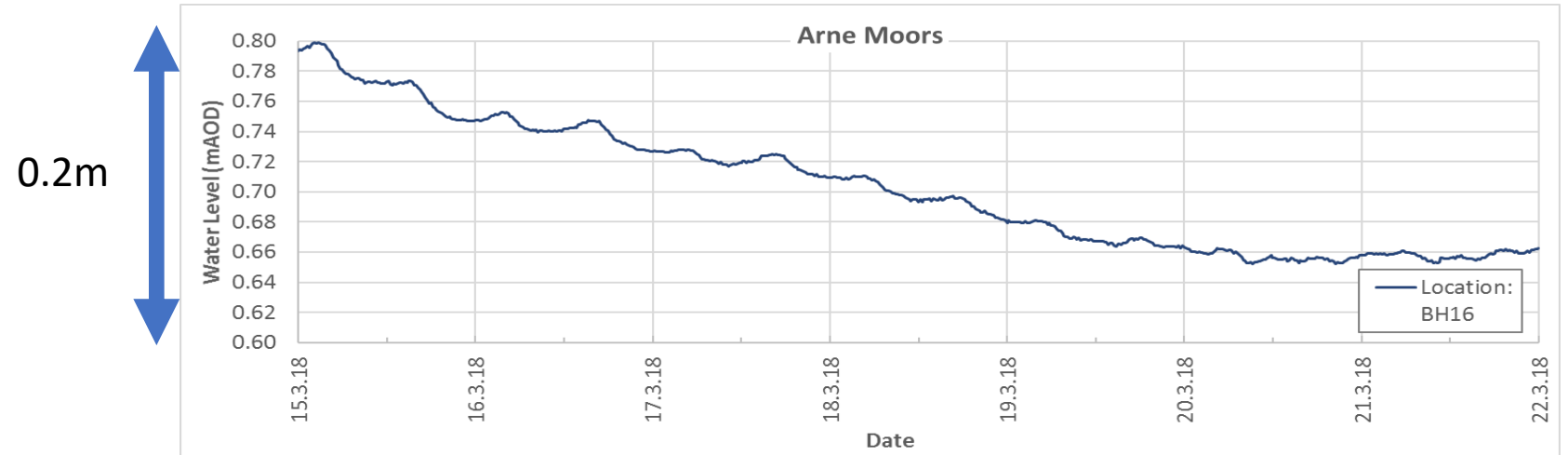
Ground Investigation - well hydrographs- detail (one week of data)

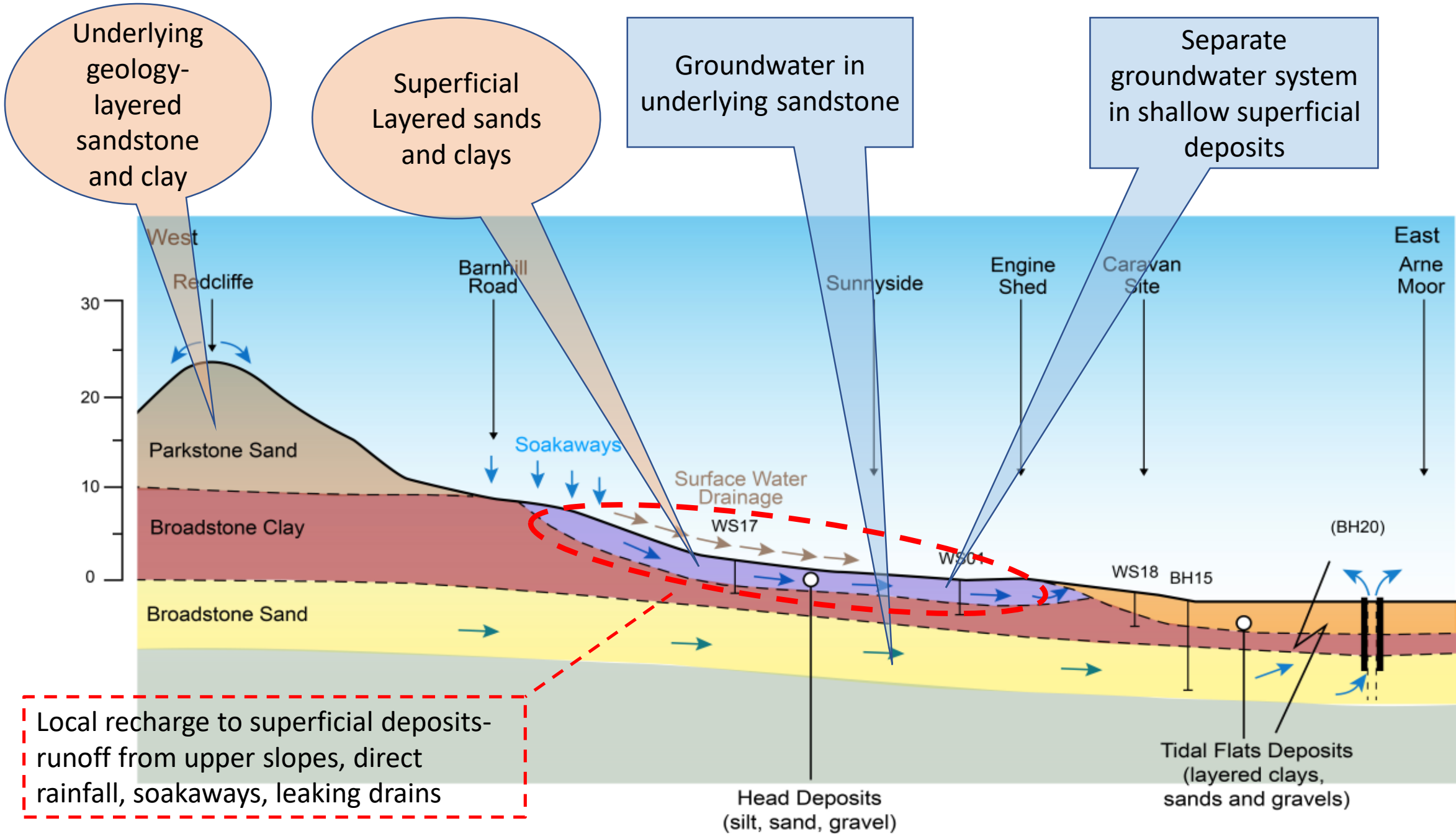
- Is there a diurnal influence at Ridge?
- Wareham tidal range typically 1- 1.2m
- No evident tidal effect at Ridge WS17



Ground Investigation - well hydrographs- detail (one week)

- Is there a tidal effect further on to Arne Moor?
- Possible minor tidal effect (1- 2 cm?) at BH16
- Relationship appears to be inverse (i.e. a tidal low results in an increase in water level)
- This is suggestive of a pressure response not direct connectivity
- BH16 close to tidal channel/ harbour
- Response zone at 2-4m depth in “upper aquifer”

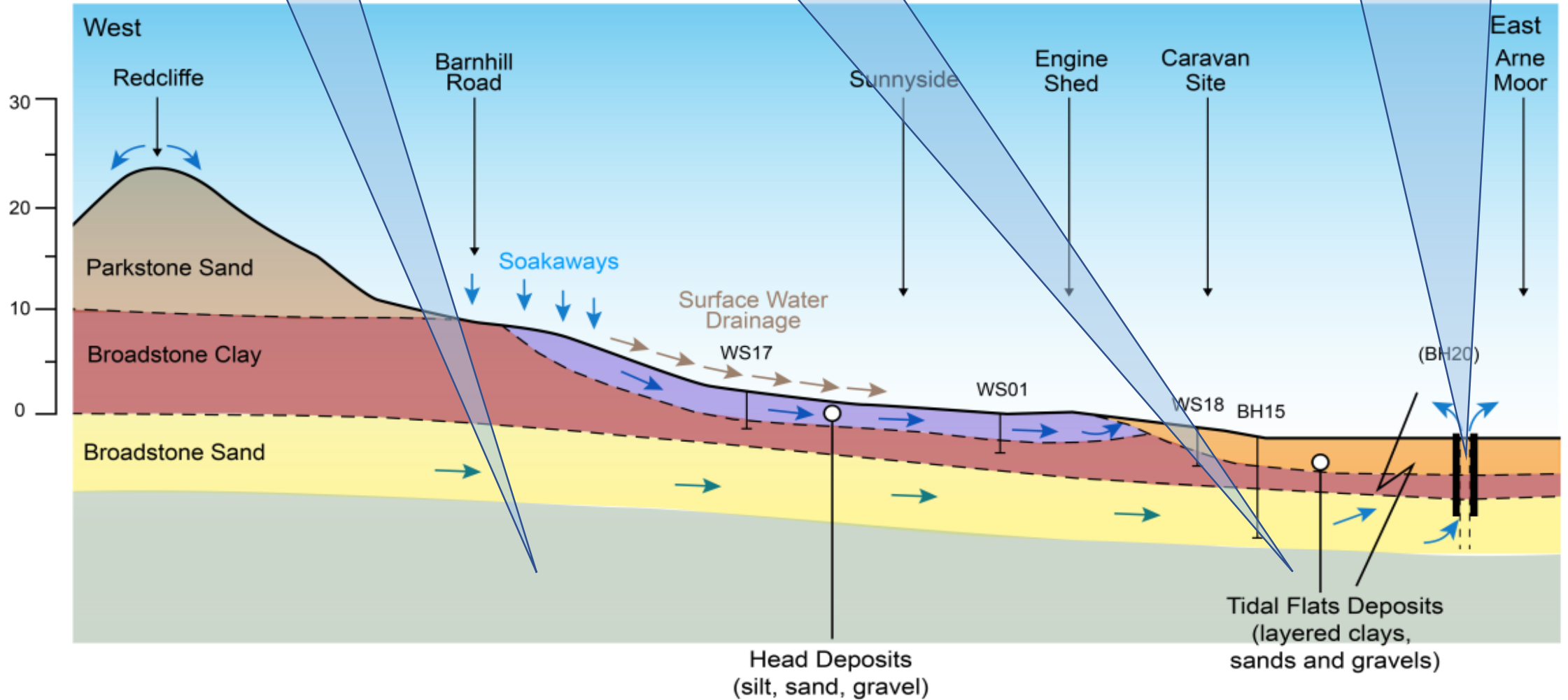




Groundwater in underlying sandstone

Arne Moors- also layered groundwater system, shallow and deep separated, by clay or peat deposits

Pressurised groundwater in underlying sandstone may rise to the surface ("artesian") when clay layer is punctured e.g. by a borehole



Thank You

Mike Barker

Principal Hydrogeologist



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