Summary of pollution events on Rivers Piall and Yealm: week beginning Monday 05 December 2022

Tony Hawkins and Julia Bertram
30 January 2023

This report has been written on behalf of more than 40 active volunteers participating within the Westcountry Rivers Trust (WRT) Citizen Science Investigation of water quality on River Yealm, using recent inputs from among those that are uploaded to the WRT Cartographer database from more than 24 sites at approximate monthly intervals. The authors do not express an opinion as to the accuracy or completeness of the information provided. Subjects, findings and presentation of facts reflect only the author's input or views, and not the wider input or views of any other organisation or body. The authors do not accept any liability if this report is used for any alternative purpose other than to help inform both the River Yealm River Quality Working Group and local Parish Councils.

1/4 The River Yealm

The River Yealm river is situated in Devon, entering the English Channel between Salcombe and Plymouth. The river runs for only about 12 miles from peat bogs on Dartmoor to the estuary at Newton Ferrers. The river and its catchment of about 100 km^2 are designated as both a Special Area of Conservation (SAC) and a Site of Special Scientific Interest (SSSI). It is also recognised for amenity, recreational and commercial values, as include fisheries for trout, salmon and sea bass, our harbour authority and oyster culture.

2/4 Timeline of pollution event

Monday 05 December

- Reports of chalky white pollution in River Piall were reported repeatedly to the Environment Agency (EA) (Incident reference 2116678) (Figures 1 to 13).
- Photographic evidence taken at 1015h of unusually high water flow saturated with kaolin-like material above Quick Bridge on the River Piall showed the source as having been the tributary from direction of Broomage Waste and Headon China clay works (Figures 3, 11 and 15). At the same time, the associated tributary from Quick Wood to River Piall above Quick Bridge (Figure 15) was running lower and clear. This was witnessed by an EA officer observed on site there at the same time.
- From its junction with the River Piall, the River Yealm was discoloured through its full length (Figures 1 to 8).
- Pollutant input to the River Piall was observed continuously for at least 6 hours from about 0800 to about 1400h.
- Heavy deposits on banks and bed of left-hand tributary looking upstream from Quicks Bridge on the River Piall, towards Headon China clay works, confirmed this as the source of pollution (Figures 11 and 15).
- Associated deposits on bed of River Piall were measured of more than 15 cm depth (Figures 9, 10 and 11).

Tuesday/Wednesday 06/07 December

- Heavy deposits were recorded as far as 5 miles downstream (Figure 12).
- We have a report of dead fish, which information and contact details have been shared with the EA.

- Numerous press releases (i.e. https://www.bbc.co.uk/news/uk-england-devon-63873254) detailed a statement from the EA as follows: "The Environment Agency has identified the source of the pollution affecting the Rivers Piall and Yealm in South Devon. We are supporting the work to stop the discharge and prevent further material from being washed down the river. We have officers at different locations on the river sampling and assessing the impact. Fisheries specialists have been on site since early this morning assessing the impact of the pollution on fish and fish habitat. This was hampered yesterday by the lack of visibility in the river caused by the pollution. More than 12 miles of watercourse have been affected". We are not aware that the EA has made any subsequent statement.

Tuesday 06 December

- Report of chalky white pollution once again in River Piall, observed from Langham Bridge whilst still dark at 0645h, reported to the EA (Incident reference 2117267) (Figure 13).
- Report of chalky white pollution in River Yealm, plus pale deposits on the foreshore, observed in Newton Ferrers and reported to the EA (Incident Number 216678) (Figures 35 to 37).

Saturday 10 December

- We understand from a witness that large quantities of white polluted water were observed running down through Broomage Wood on Monday 05 December, on to PROW footpath 25, which is the footpath illustrated in red bordering Broomage waste in Figure 16.
- We also understand that later on Monday 05 December, “there was much activity clearing the path with bulldozers and diggers”, access to that path being available through a gate to nearby workings.
- The has been no significant rain since Monday 05 December, such that photographs taken on Saturday 10 December illustrate the height of polluted water that must have swept down (i) PROW footpath 25, as evidenced by deposits at least 2 feet above that path on bordering trees and fencing (Figures 17 and 18); including (ii) the top end of tributary from Broomage down to Quick Bridge, as evidenced by deposits on bordering reeds about 1 foot above the current water level (Figure 19).

Wednesday 14 December

- Eight days on following the pollution event of Monday 05 December, thick deposits of kaolin-like material remain on the banks and beds of River Piall (Figures 20 and 21).
- The source of pollution onto PROW footpath 25 was traced up through Broomage Wood (Figure 22) into field above Tin Park (Figure 23). The area there has been cleared very recently using tracked vehicles, presumably on Mon 05 December as suggested above, and a significant dry-stone wall of about 10 metres length also rebuilt close to the area where pollution appears to have issued (Figures 23 and 24).
- Witnesses have described how horses had been spooked with resulting damage to a gate by shaking ground and associated rumbling at that site both over the summer and in recent weeks.
- We understand that on Monday 05 December Sibelco, who operate Headon China clay works, asked permission of the owners of Tin Park to repair what we understand was then described as a “burst pipe” at the above site, which permission was granted.

Saturday 17 December

- Deposits from overland pollution running down the side of Broomage Wood to PROW Footpath 25, as evidenced in Figure 22, have been thoroughly cleared away (Figure 26).

Tuesday 20 December

- Further evidence of dead fish was received, this time photographic, of a sizeable sea trout near the weir at Lucas Wood on River Yealm (Figures 27 and 28). These photographs were taken on 06 December, one day after the main pollution event. At the same time, Figure 27

also evidences heavy sediment smothering the river bed. The person who has provided these photographs describes how he gave two staff from the Environment Agency permission to access the river over private property, and who stated they had observed dead fish.

Thursday 22 December

- Seventeen days on following the pollution event of Monday 05 December, thick deposits of kaolin-like material remain on the banks and beds of River Piall (Figures 29 and 30), which is still running chalky white (Figure 31).

Monday 09 January 2023

- Thirty five days on following the pollution event of Monday 05 December, deposits of kaolin-like material remain on the banks and beds of River Piall (Figure 32 and 33), which is still running chalky white (Figure 34).

3/4 General Comments

There had been no significant rain for the previous 7 days, and when water levels were towards the bottom of typical range (Figure 14). Therefore, there can have been no immediate need for discharge. Further to which, it is clear that the scale of pollution far exceeded licensed conditions for such discharge, in any case flowing in large part outside of “normal” (licenced) watercourses (Figures 17, 18, 22, 23 and 24).

In possible explanation, given the evidence and information gathered as described above on Wednesday 14 December, pollution of kaolin-like material into Rivers Piall and Yealm on Monday 05 December may have originated from a pipe above Tin Park. We have yet to establish the exact purpose or location of that pipe. Nor are we aware of any associated statement describing or explaining any such event.

Many of the photographs within this report have been recorded as part of the Westcountry Rivers Trust (WRT) Citizen Science Investigation of water quality on River Yealm, involving more than 40 active volunteers uploading measures to the WRT Cartographer database from more than 24 sites at approximate monthly intervals. Frustratingly, whilst photographs illustrated here were recorded in association with measures of turbidity, that turbidity on 5 Dec far-exceeded the maximum we were able to measure using the WRT test kit.

Notably, about 12 previous consecutive monthly photographs of the weir illustrated in Figure 3 have been uploaded to the WRT Cartographer database. Those photographs collectively establish the exceptionally high flow associated with this pollution, in the absence of significant rainfall; and from which photographs, this additional flow might presumably be estimated.

There can be no doubt that such concentrations of suspended matter disorientated fish, amphibians and invertebrates, at the same time smothering their gills, many thus unable to respire/breath.

Such effects seem likely to have been confirmed by both verbal and pictorial evidence of dead fish (Figure 27 and 28) on our river banks in the days immediately following this pollution event.

Worse, as long as 35 days after pollution on Monday 05 December, our river banks and bed remain covered with what appears to be a deep layer of kaolin for many miles downstream, depriving all plant and animal life of both light and oxygen (Figures 29, 30, 31, 32 and 33). Whilst there has been significant effort sent clearing sediment from its source overland (Figure 26 and elsewhere), we are not aware of any such effort towards clearing the same sediment from our rivers.

Breeding grounds for trout and salmon depend upon interstitial spaces within which to lay eggs for protection, and which spaces will now be clogged, perhaps for years, with the inevitable loss of this year's eggs, normally laid by salmon between November and January.

Records establish that pollution from clay workings into the Rivers Piall and Yealm have occurred repeatedly many times over the past 50 years, amid deepening concern, of most recent note on 16 November 2020. Then, the EA categorised the River Yealm turning white as a 'serious incident'. According to a report by Plymouth Live, a spokesperson for the EA said rainfall had caused contaminated run-off to escape the containment area of a quarry-related operation. The spokesperson also said that while the discolouration was intense, it was short-lived and washed through the system quickly. We understand that action was taken to stop any further quarry discharge, and that no prosecution was made.

This event commencing 05 December 2022 will have more severe ecological impact, associated with the smothering of banks and bed for miles downstream. This would appear to have resulted from a greater particle-size of pollutant, such as within sludge that had previously settled elsewhere, rather than finer particles that were already in suspension.

We are unsure when the cause of this event will be disclosed by the Environment Agency, who may argue that any such disclosure might compromise effective prosecution of the guilty party, thus not in the public interest.

Primary questions outstanding include:

a) How long might it take to clean up our river banks and bed?
b) What effects and cost will this pollution and its associated clean-up have on both the ecology and amenity value of our environment?
c) Has the cause of this event been established?
d) Might prosecution be the only effective means to help stop this happening yet again?
e) Whilst a significant associated fine could also help stop this happening yet again, might the proceeds from such a fine, or an agreed alternative contribution, best be invested back into restoring the biodiversity and ecology of our river?
f) Will the Environment Agency provide us with written assurance that the above questions will be answered, together with an interim assurance of associated progress?

4/4 Figures

Figure 1: River Piall reported to the EA by Liz Thomas 0830h 05Dec22

Figure 2: River Piall reported to the EA by Gillian Glegg 0855h 05Dec22

Figure 3: Weir on tributary from Headon China clay works to Quick Bridge on River Piall recorded by Julia Bertram 1015h 05Dec22

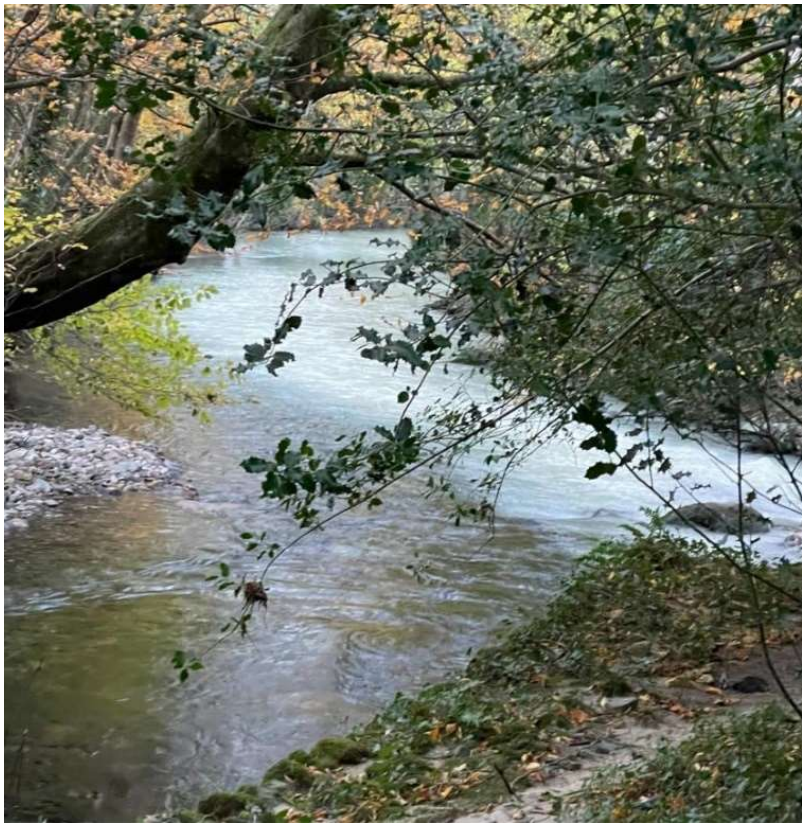

Figure 4: Junction of Rivers Piall and Yealm recorded by Kim Thomson 0830h 05Dec22

Figure 5. River Yealm at Popple's Bridge, about 5 miles downstream of Quick Bridge, recorded by Neil Tugwell 0950h 05Dec22

Figure 6. River Yealm at Popple's Bridge, about 5 miles downstream of Quick Bridge, recorded by Neil Tugwell 0950h 05Dec22

Figure 7: River Yealm at Worston Mill, about 6 miles downstream of Quick Bridge, recorded by Charles Weston-Baker 1354h 05Dec22

Figure 8: River Yealm below Yealm Bridge, about 8 miles downstream of Quick Bridge, recorded by Tony Hawkins 1444h 05Dec22

Figure 9: Kaolin-like deposits at Piall Bridge, about 0.5 miles downstream of Quick Bridge, reported to the EA by Julia Bertram late morning 1430h 05Dec22

Figure 10: Kaolin-like like deposits measured as more than 15 cm deep at Piall Bridge, about 0.5 miles downstream of Quick Bridge, recorded by Julia Bertram 1430h 05Dec22

Figure 11: Heavy deposits on banks and bed of left-hand tributary looking upstream from Quicks Bridge on the River Piall, towards Headon China clay works, recorded by Julia Bertram 1415h 05Dec22

Figure 12 : Heavy deposits on bed of River Yealm close to Lotherton Bridge, about 5 miles below Quick Bridge, recorded by Chris Westwood 07Dec22

Figure 13: River Piall from Langham Bridge recorded by Rowena Parker 0645h 06Dec22

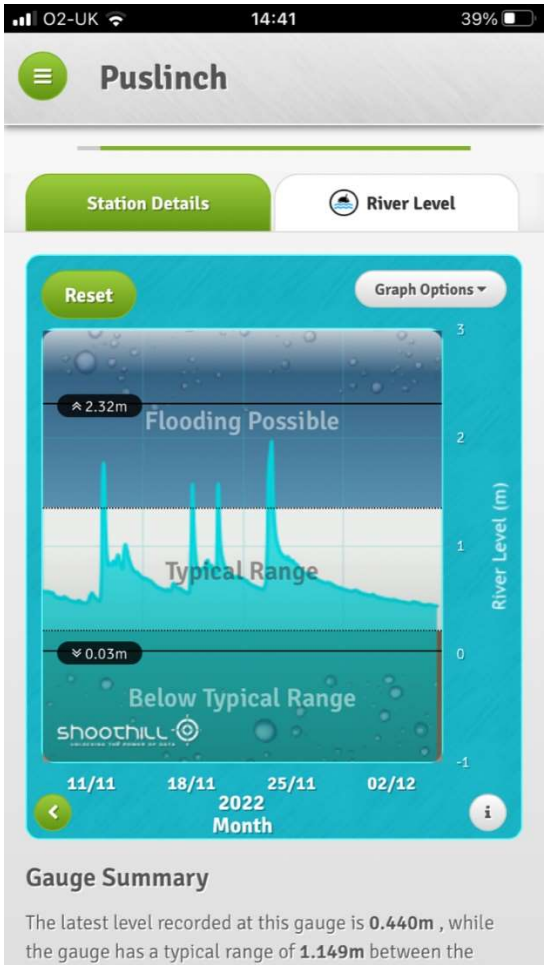

Figure 14: Height of River Yealm recorded at Puslinch Gauging Station, establishing no significant rainfall in the seven days prior to event of 05 December 2022

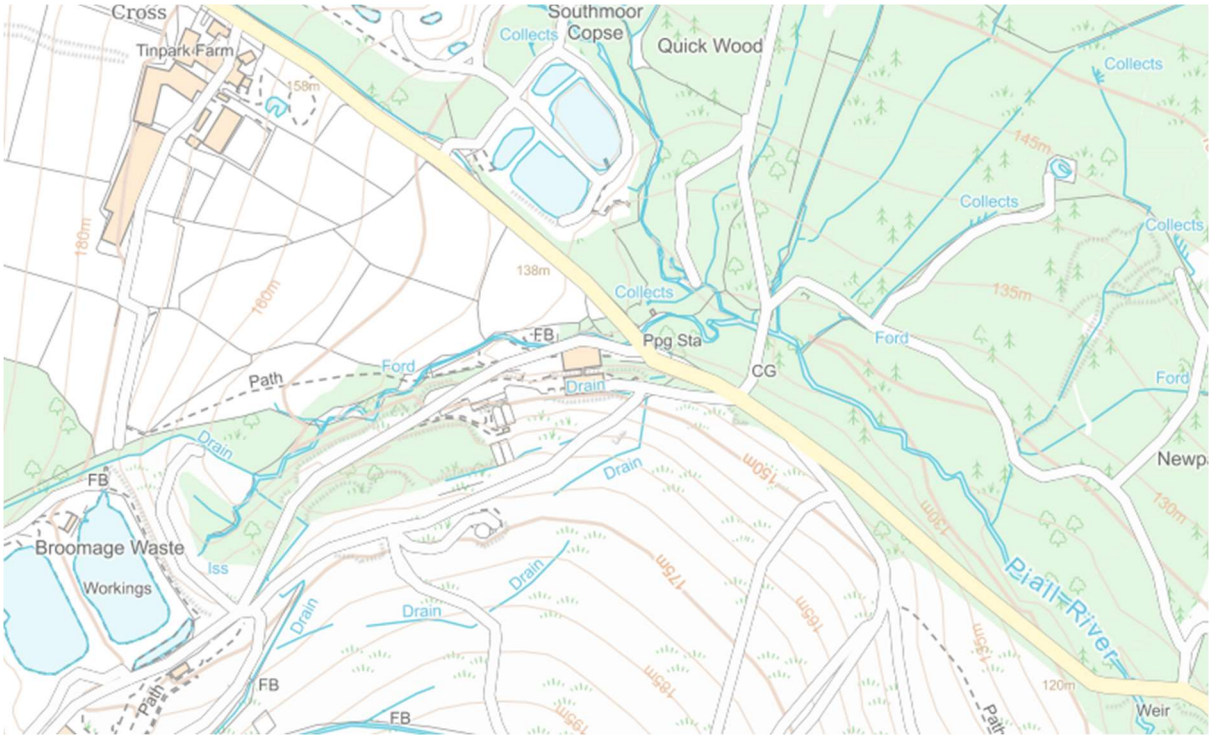

Figure 15: Map of tributaries and area surrounding the River Piall at Quick Bridge (this map has been taken from the Parish OnLine database, only for use on a " not for profit" basis)

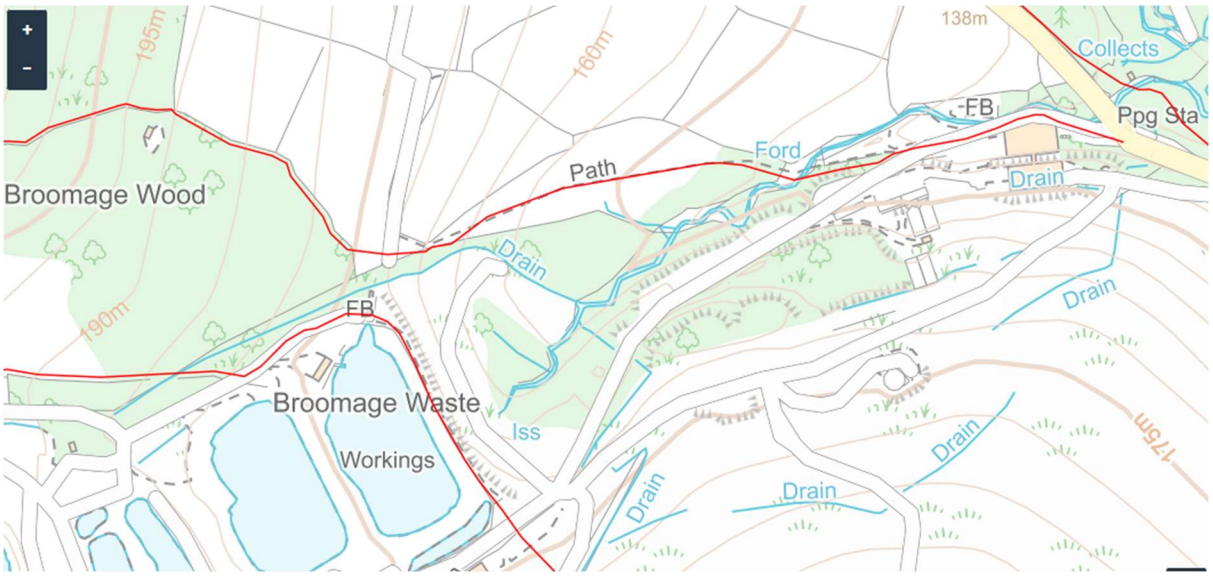

Figure 16: Map of footpaths (in red) neighbouring Broomage Waste (this map has been taken from the Parish OnLine database, only for use on a " not for profit" basis)

Figure 17: Deposits on the remainder of fencing bordering PROW Footpath 25 recorded by Julia Bertram 1120h 10Dec22

Figure 18: Deposits on tree trunk bordering PROW Footpath 25 recorded by Julia Bertram 1120h 10Dec22

Figure 19: Deposits on reeds bordering the top end of tributary from Broomage down to Quick Bridge (in this photograph, the water is actually running clear above a thick layer of white sediment, which apparently is “normal” at this location)

Figure 20: Deposits remaining above the weir on tributary from Headon China clay works to Quick Bridge on the River Piall recorded by Tony Hawkins 1005h 14Dec22

Figure 21: Deposits remaining below Piall Bridge recorded by Tony Hawkins 0950h 14Dec22

Figure 22: Recent deposits of kaolin-like matter running down the side of Broomage Wood to PROW Footpath 25 recorded by Tony Hawkins 1010h 14Dec22

Figure 23: Recent deposits of kaolin-like material evidencing overland pollution running into the top of Broomage Wood from field above Tin Park recorded by Tony Hawkins 1020h 14Dec22

Figure 24: Recent deposits of kaolin-like material evidencing overland pollution running down the side of field above Tin Park from site where hedge has since been rebuilt recorded by Tony Hawkins 1030h 14Dec22

Figure 25: Workings but with no associated evidence of pollution on the western side of rebuilt wall adjoining field above Tin Park recorded by Tony Hawkins 1010h 14Dec22

Figure 26: Deposits from overland pollution running down the side of Broomage Wood to PROW Footpath 25 (evidenced in Figure 22) have been cleared away recorded by Julia Bertram 17Dec22

Figure 27: River Yealm by weir near Lucas Wood showing bottom sediment and dead fish recorded by Joe Brewer 06Dec22

Figure 28: Dead sea trout by weir near Lucas Wood on River Yealm recorded by Joe Brewer 06Dec22

Figure 29: Deposits remaining 17 days later below the weir on tributary from Headon China clay works to Quick Bridge on the River Piall recorded by Julia Bertram 1000h 22Dec22

Figure 30: Deposits remaining 17 days later below the weir on tributary from Headon China clay works to Quick Bridge on the River Piall recorded by Julia Bertram 1005h 22Dec22

Figure 31: River Piall at Quick Bridge recorded by Julia Bertram 0955 22Dec22

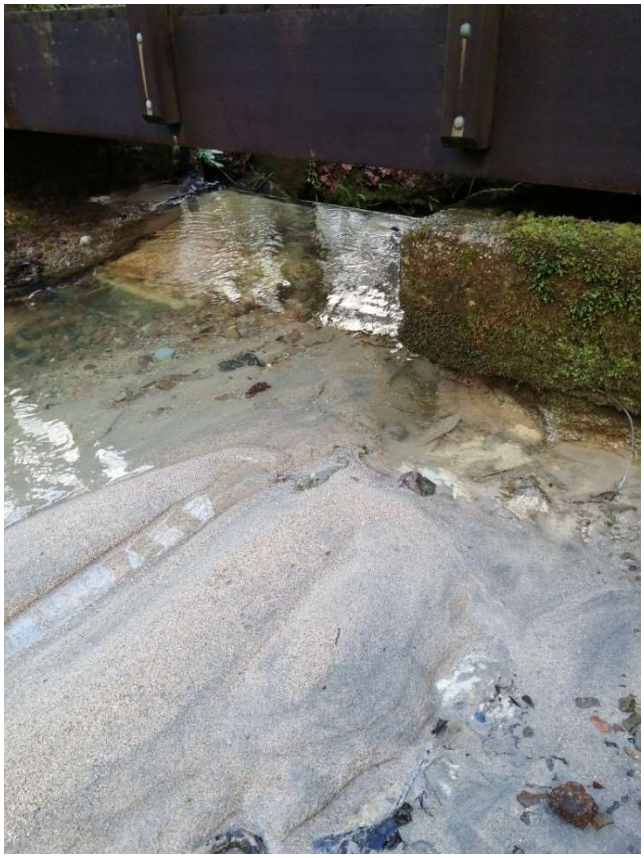

Figure 32: Deposits remaining 35 days later below the foot bridge over tributary from Headon China clay works to Quick Bridge on the River Piall recorded by Julia Bertram 09Jan2023

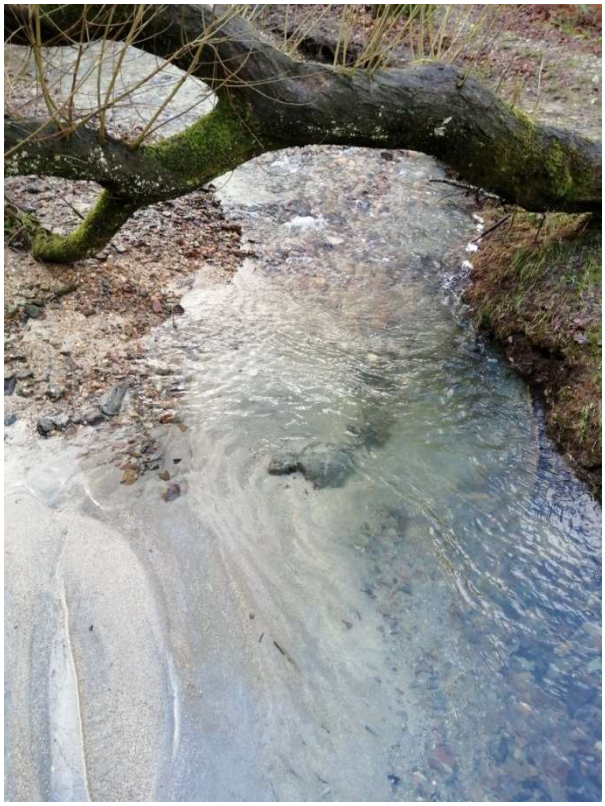

Figure 33: Deposits remaining 35 days later below the weir on tributary from Headon China clay works to Quick Bridge on the River Piall recorded by Julia Bertram 09Jan23

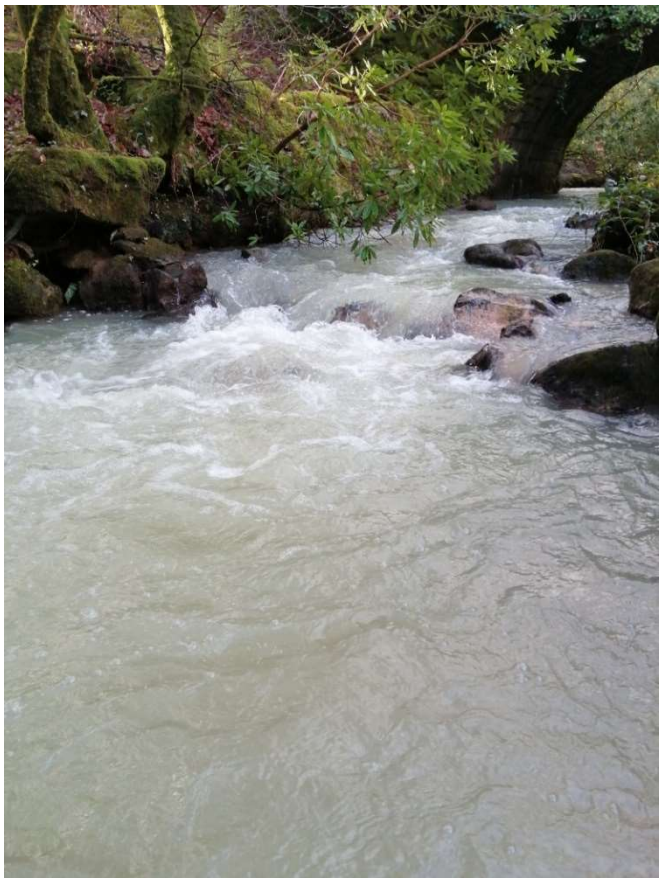

Figure 34: River Piall at Quick Bridge recorded by Julia Bertram 09Jan23

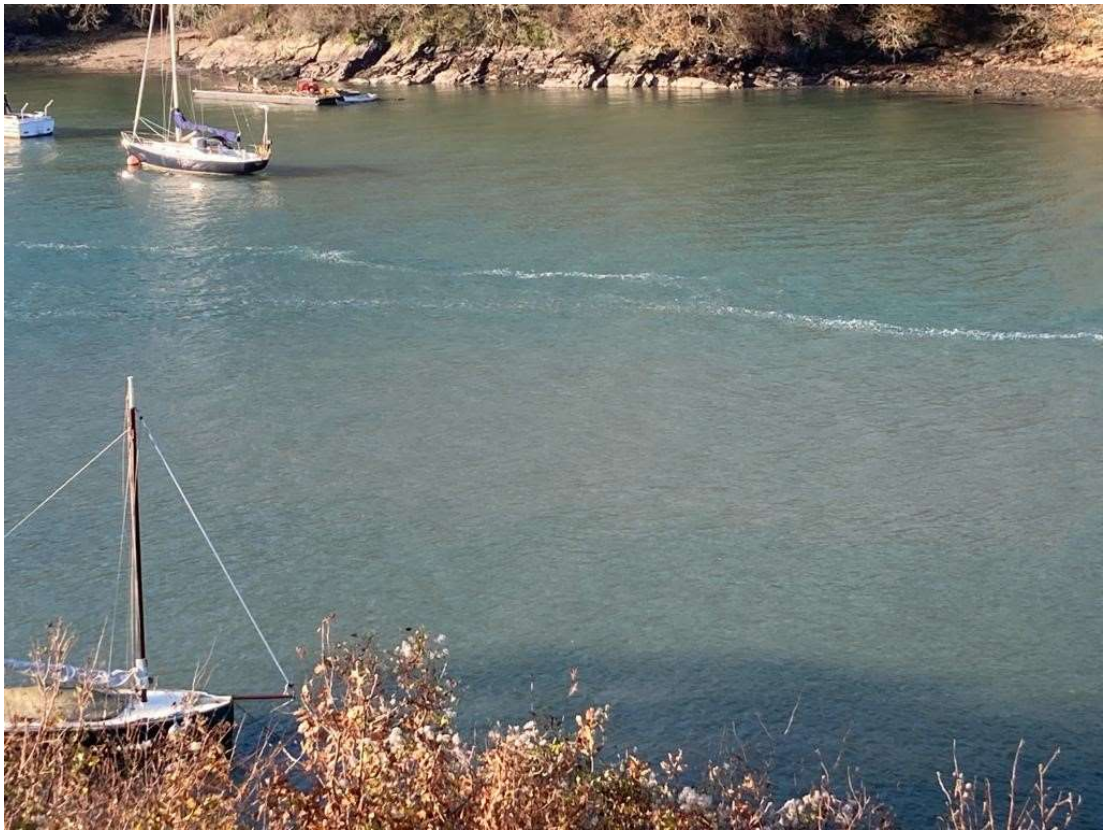

Figure 35: River Yealm at Newton Ferrers recorded and reported by Nicky Tewson (EA Incident Number 216678) 1045h 06Dec22

Figure 36: Pale deposits on foreshore of River Yealm at Newton Ferrers recorded by Nicky Tewson 1046h 06Dec22

Figure 37: Pale deposits on foreshore of River Yealm at Newton Ferrers recorded by Nicky Tewson 1048h 06Dec22