TECHNICAL NOTE

JBA Project Code	2024s1883
Contract	Surrey Heath Local Plan hearing support
Client	Surrey Heath Borough Council
Day, Date and Time	24 November 2025
Author	Paul Eccleston
Reviewer / Sign off	Alex Garratt
Subject	Review of water quality trends at Camberley and Lightwater

1 Introduction

Document SHBC27 provided a statement of response from Surrey Heath Borough Council (SHBC) to the representations regarding wastewater treatment capacity and water quality impacts from the Environment Agency (REP1A, REP1B) and Thames Water (REP3). The statement of response included the conclusion that *"water quality modelling of the cumulative impact predicts that the increase in wastewater discharges as a result of planned growth at Camberley and Lightwater will not cause a deterioration as defined in Environment Agency guidance on the Water Framework Directive."*

This conclusion was based on the modelling carried out as part of the Water Cycle Study (SHBC7), using the Environment Agency's SIMCAT model of the Thames catchment. This model was based on water quality and flow data for the period 2014 to 2020. As part of the WCS assessment, the flow from wastewater treatment works was updated to a 2024 baseline, but water quality was not changed. This approach is taken because updating the water quality inputs can lead the model to require re-calibration. JBA Consulting consider that it would be an inefficient and disproportionate use of public funds for Local Planning Authorities to be required to re-calibrate models developed and maintained by the Environment Agency and water companies.

This technical note reviews the available water quality sampling evidence at Camberley STW and the River Blackwater and at Lightwater STW and the Hale Bourne. The purpose is to identify any recent evidence on water quality.

Water quality sampling data was downloaded from the Environment Agency's Water Quality Archive, for the period January 2021 to October 2025. The investigation focussed on the sanitary determinands ammonia, biochemical oxygen demand (BOD) and phosphorous. Results were graphed and R^2, the coefficient of determination was calculated to indicate trends in the concentration of pollutants over time.

Qualified values were treated at face value, for example a concentration of BOD of <2.8mg/l was treated as 2.8mg/l. Where possible outliers greater than 3 standard deviations above the mean were identified which might influence the results, these were graphed with and without the outlier values included.

Where phosphorous as P is recorded (AKA total phosphorous) this is presented, elsewhere the orthophosphate values are graphed.

2 Camberley

2.1 Data collection

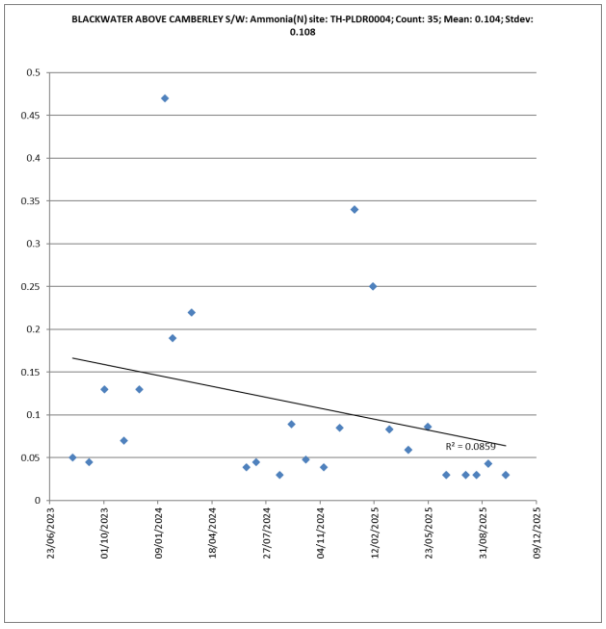
Water quality sampling data was available for the Camberley STW final effluent discharge, and for the River Blackwater upstream and downstream of the discharge:

- TH-PLDR0004 - Blackwater Above Camberley S/W
- TH-PLDE0022- Camberley STW
- TH-PLDR0135 – Blackwater at A30 Road Bridge

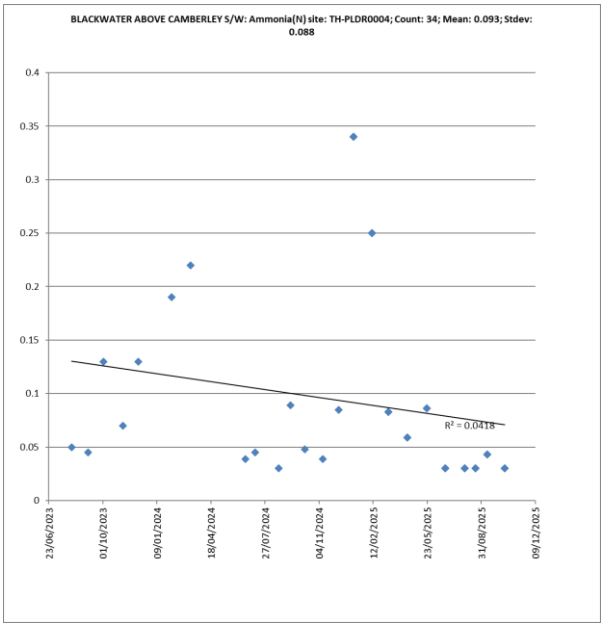
2.2 TH-PLDR0004 - Blackwater Above Camberley S/W

Sampling at this site commenced in August 2023, therefore there is a limited time period to assess for trends.

2.2.1 Ammonia



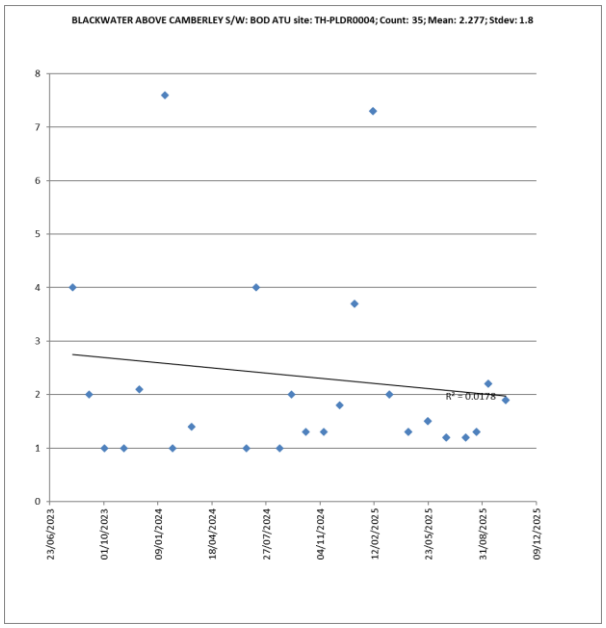
Full data



1no. outlier removed

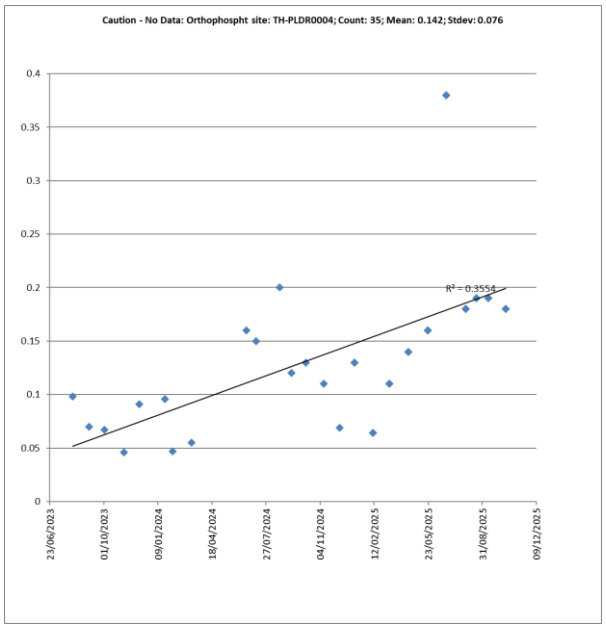
Weak indication of reducing concentration over time.

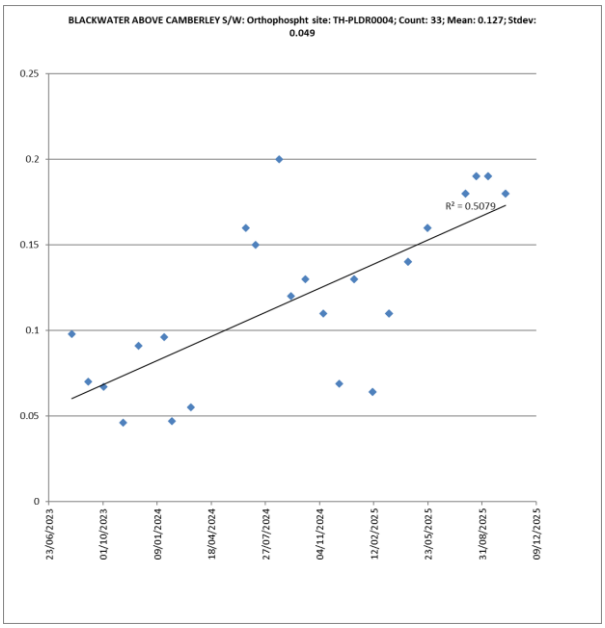
2.2.2 BOD



Weak indication of reducing concentration over time.

2.2.3 Orthophosphate





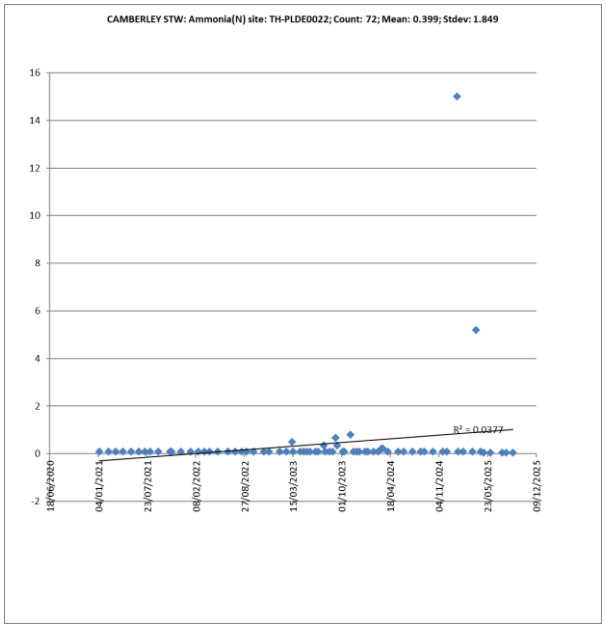
Full data

2no. outliers removed

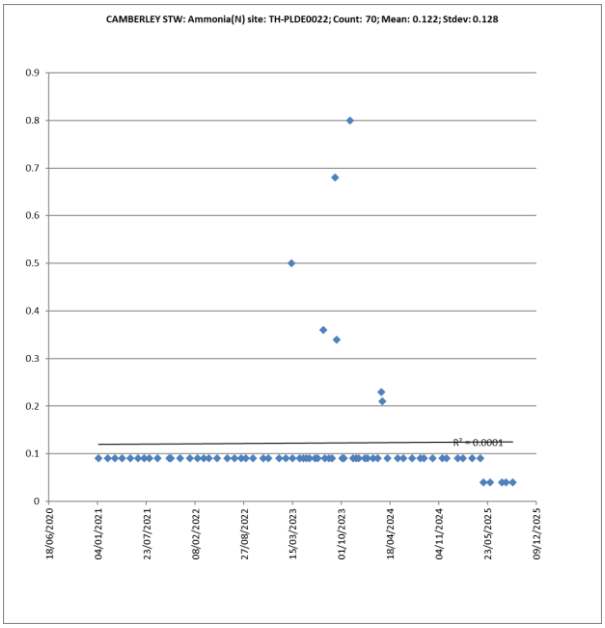
Moderate indication of increasing concentration over time.

2.3 TH-PLDE0022- Camberley STW

2.3.1 Ammonia



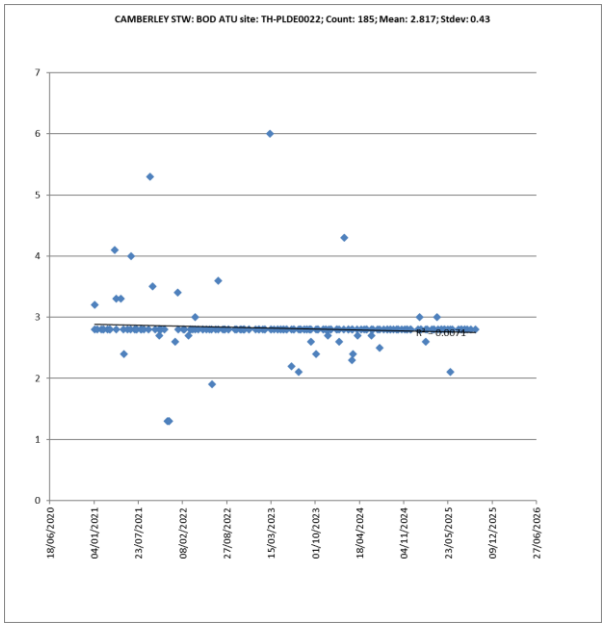
Full data



2no. outliers removed

Concentrations remain stable over time.

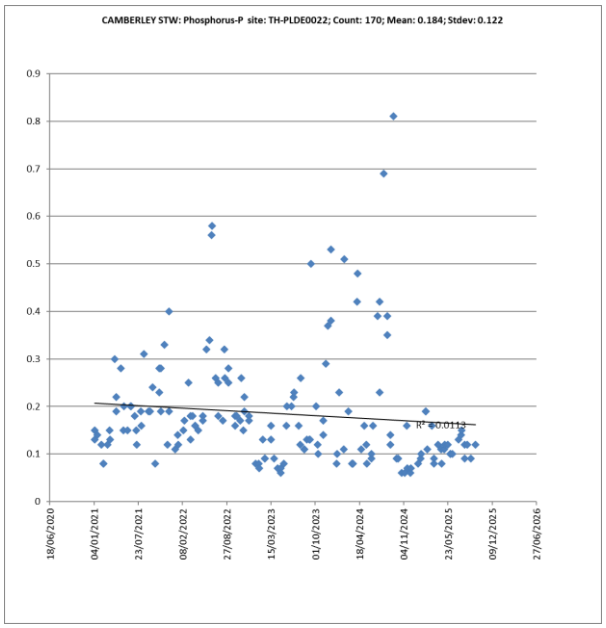
2.3.2 BOD



Mainly qualified values at 2.8mg/l.

Concentrations remain stable over time.

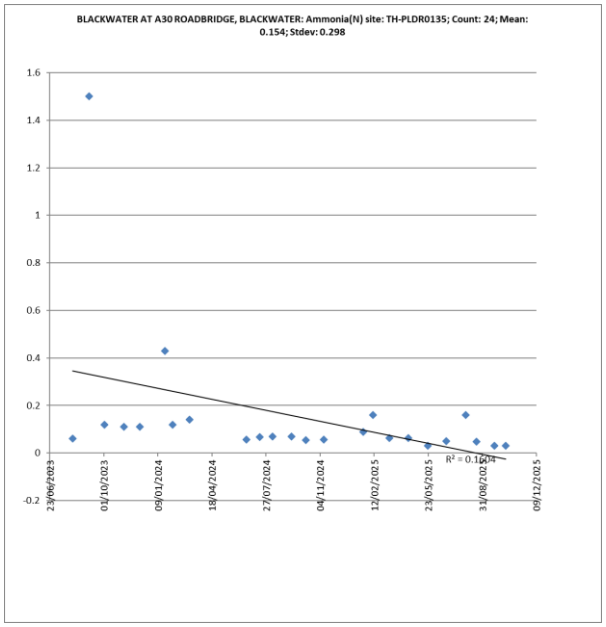
2.3.3 Phosphorous



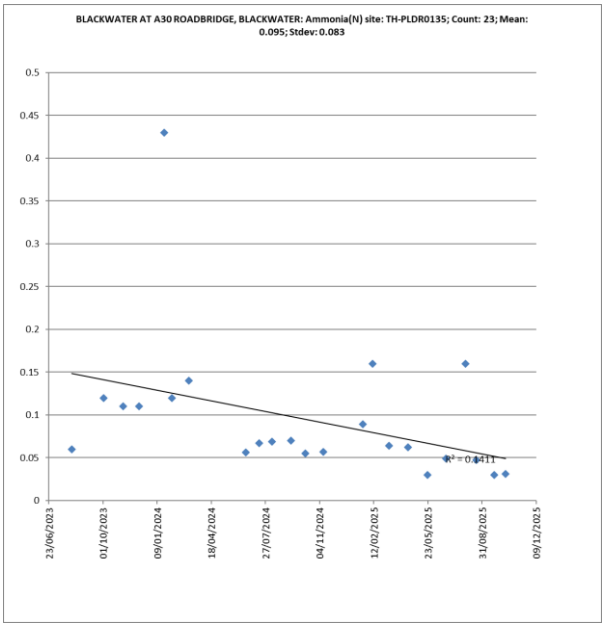
Concentrations remain stable over time.

2.4 TH-PLDR0135 – Blackwater at A30 Road Bridge

2.4.1 Ammonia



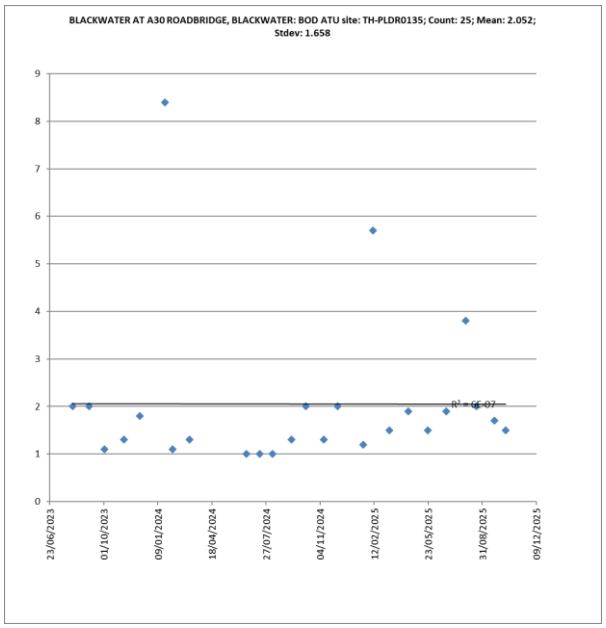
Full data



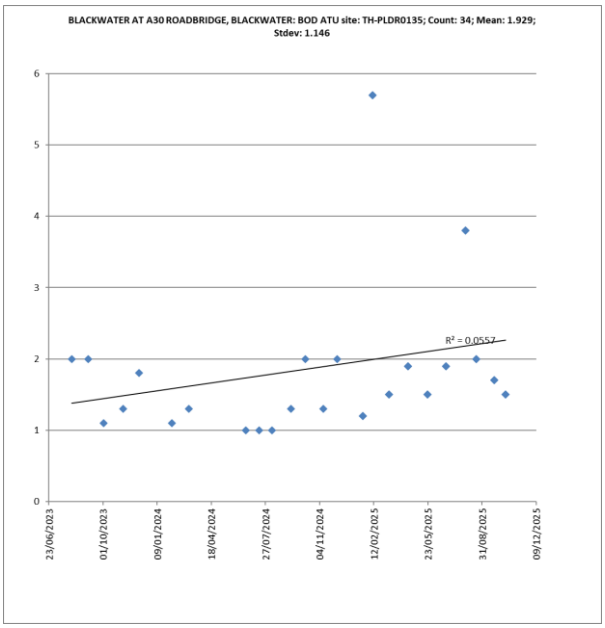
1no. outlier removed

Weak indication of reducing concentration over time

2.4.2 BOD



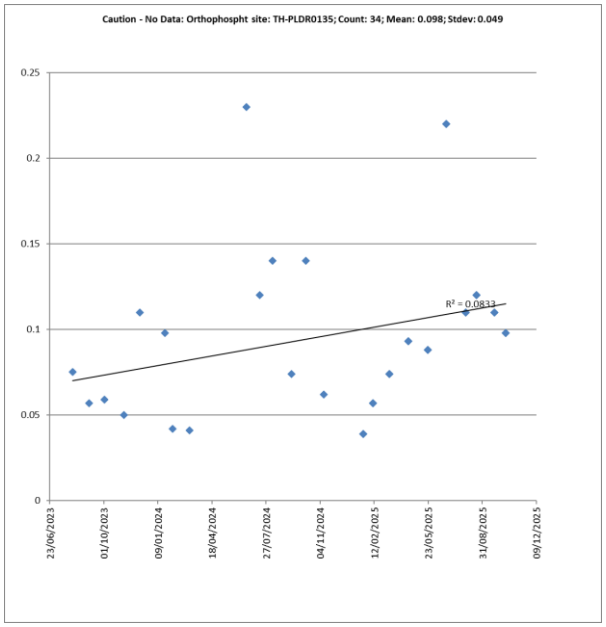
Full data



1no. outlier removed

Concentrations remain stable over time, although weak indication of increase if single outlier valuer is removed.

2.4.3 Orthophosphate



Weak indication of increasing concentration over time

2.5 Summary of results at Camberley

Site (from upstream to downstream)	Ammonia	BOD	Phosphorus / Orthophosphate
Blackwater Above Camberley S/W	↓	=	↑
Camberley STW	=	=	=
Blackwater at A30 Road Bridge	↓	=	↑

↓ reducing = stable ↑ increasing

Results for ammonia show a weak indication of reducing concentration over time both upstream and downstream of Camberley STW, whilst BOD remains stable. For orthophosphate, this is increasing both upstream and downstream. However, average concentrations at the downstream site were lower (0.098mg/l) than upstream of the STW (0.140mg/l), suggesting that Camberley STW is actually diluting the concentration in the Blackwater.

3 Lightwater

3.1 Data collection

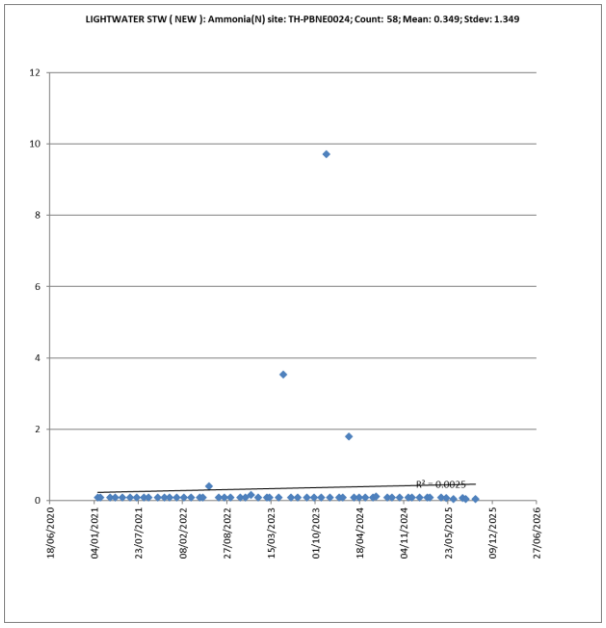
Water quality sampling data was available for the Lightwater STW final effluent discharge, and for the Hale Bourne downstream of the discharge. No sampling data is available upstream of Lightwater STW:

- TH-PBNE0024 – Lightwater STW
- TH-PBNR-0006 – Hale Bourne at Halebourne Lane, Chobham

Note that sampling site TH-PBNR0027 Hale Bourne below Lightwater STW is the closest downstream station, but no data for this site was available in the data downloaded from the Water Quality Archive.

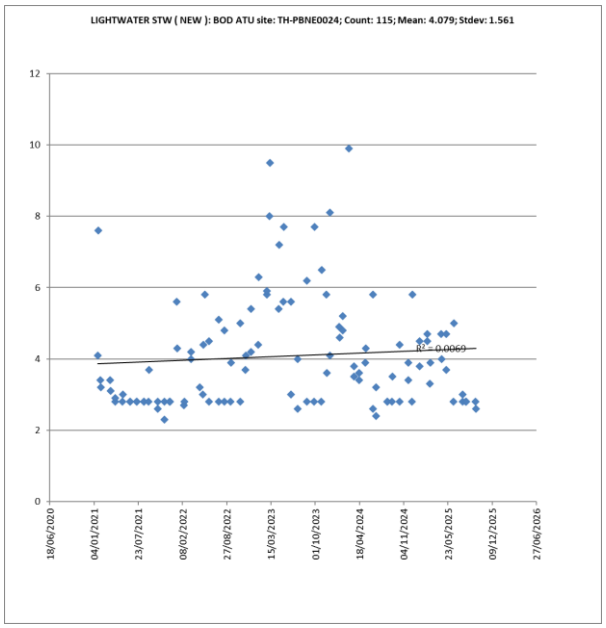
3.2 TH-PBNE0024 – Lightwater STW

3.2.1 Ammonia



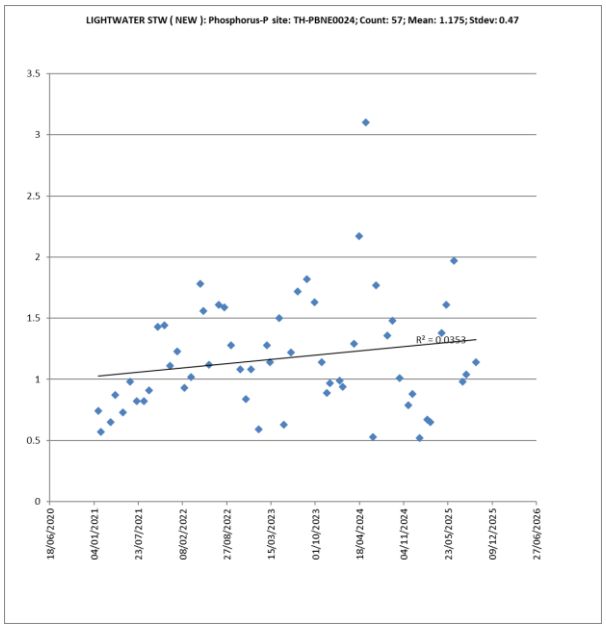
Concentrations remain stable over time.

3.2.2 BOD



Concentrations remain stable over time.

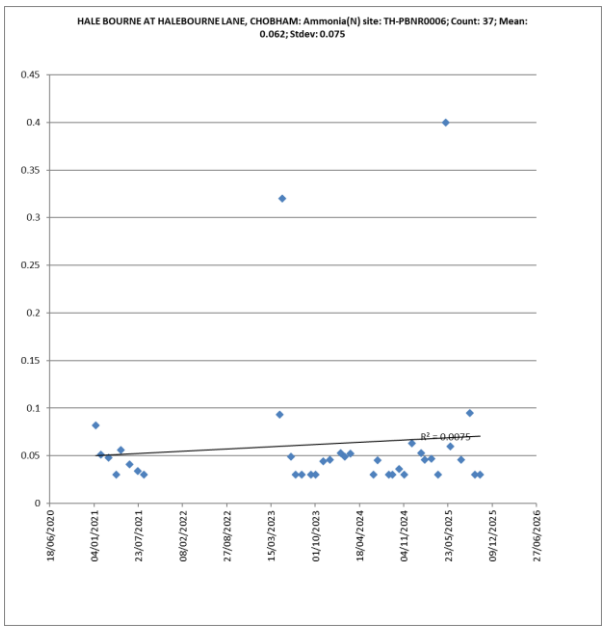
3.2.3 Phosphorous



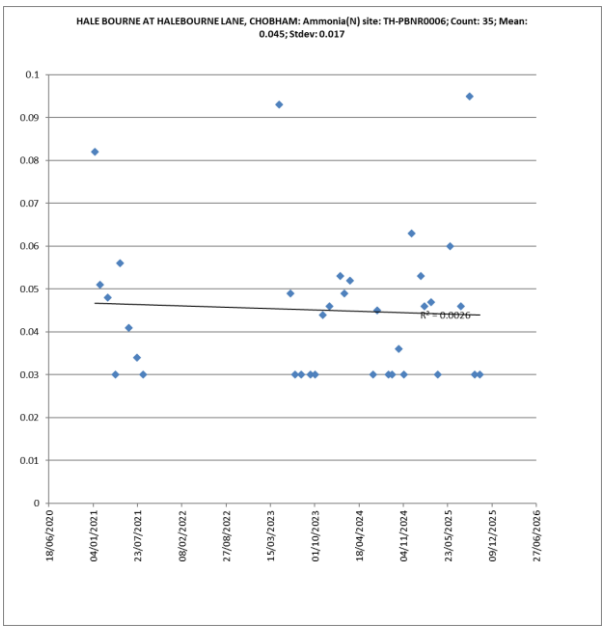
Weak indication of increasing concentration over time.

3.3 TH-PBNR-0006 – Hale Bourne at Halebourne Lane, Chobham

3.3.1 Ammonia



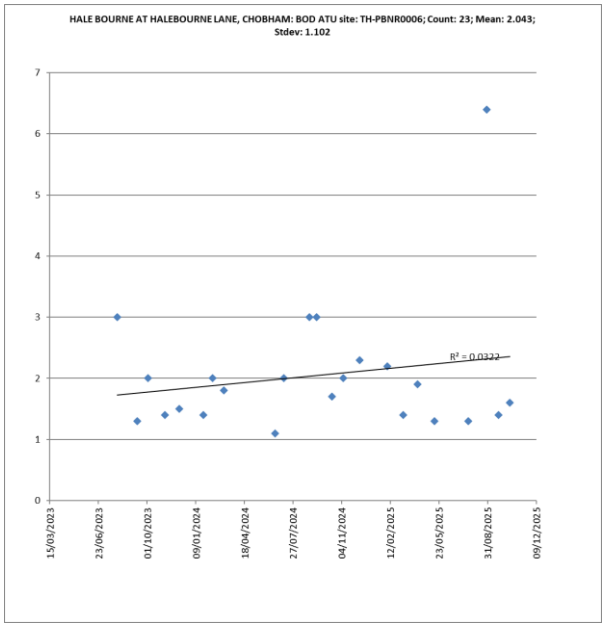
Full data



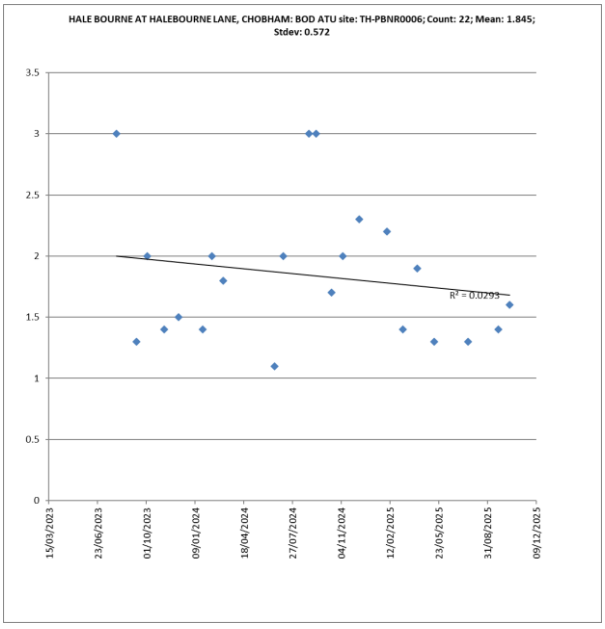
2no. outliers removed:

Concentrations remain stable over time.

3.3.2 BOD



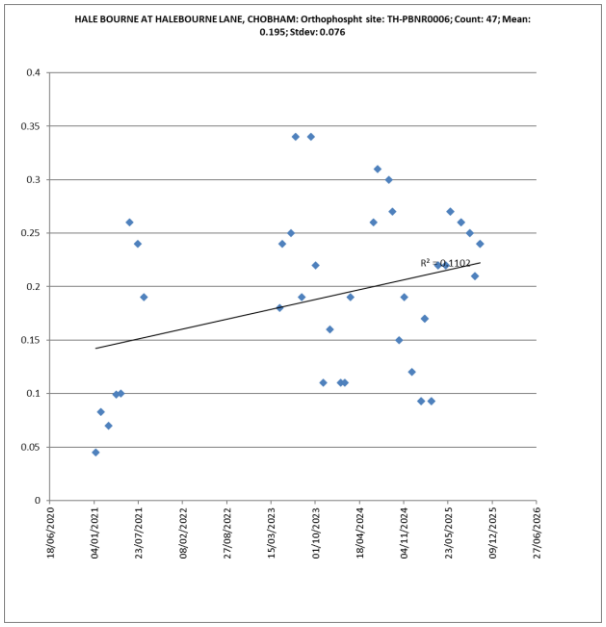
Full data



1no. outlier removed.

Weak indication of increasing concentration over time is as a result of one high outlier value in 2025.

3.3.3 Orthophosphate



Weak indication of increasing concentration over time

3.4 Summary of results at Lightwater

Site (from upstream to downstream)	Ammonia	BOD	Phosphorus / Orthophosphate
Lightwater STW	=	=	↑
Hale Bourne at Halebourne Lane, Chobham	=	=	↑

↓ reducing = stable ↑ increasing

Concentrations of ammonia and BOD are stable in the Lightwater STW effluent and downstream at Halebourne Lane, Chobham. For phosphorous / orthophosphate, there is a weak indication of increasing concentrations at both Lightwater STW and downstream at Halebourne Lane.

4 Conclusions

- There is no evidence of a deterioration in water quality in the River Blackwater as a result of effluent discharged from Camberley STW. The weak indication of increasing concentrations of orthophosphate over time may be as a result of

activities upstream of Camberley STW, since there is a stronger increasing trend and higher average concentrations observed at the upstream station. The evidence suggests Camberley STW may be having a diluting impact.

- There is a weak indication of an increase in phosphorous in the Lightwater STW effluent and of orthophosphate downstream in the Hale Bourne. These are weak indications and not sufficient to conclude a deteriorating trend.
- Notwithstanding the above, the conclusion of the Surrey Heath Water Cycle Study 2024 that planned growth at Camberley and Lightwater will not cause a deterioration to the receiving waterbodies remains valid and robust.