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PROJECT	Chilmington Green Ashford, Kent	CLIENT	Hodson Developments			
TITLE	River Beult Monitoring February 2024	REFERENCE	22074-SVY-TN-05	C01		
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1 Introduction

- 1.1 Water Environment was commissioned by Hodson Developments Ltd to undertake surface water baseline monitoring at five locations along the River Beult and tributaries to the southwest of Ashford in Kent.
- 1.2 Monitoring included the collection of water samples for laboratory chemical analysis, the recording of in field physico-chemical parameters and the flow profiles of the watercourse. General observations of visual pollution, lack of flow and other environmental factors were also recorded.
- 1.3 The monitoring schedule is set out over twelve months and occurs approximately fortnightly at five different locations, identified during a preliminary walkover survey. Sites descriptions have been included below:
 - 1- Chilmington Green Road Discharge Point (Grid Ref. TQ 98335 39335)
 - 2- Chilmington Green Road 2 (Grid Ref. TQ 98064 39400)
 - 3- Boyce Wood (Grid Ref. TQ 97043 39153)
 - 4- Bethersden Road (Grid Ref. TQ 96573 38580)
 - 5- Kiln Wood (Grid Ref. TQ 95736 38649)
- 1.4 A detailed site location plan can be found in
- 1.5 Appendix A.
- 1.6 Monitoring results are presented in a monthly report, with a final report issued on the completion of the monitoring study.
- 1.7 This report summarises two rounds of sampling undertaken in February.

2 Monitoring and Sampling Methodology

- 2.1 Water Environment attended site on the 06th and the 22nd of February 2024.
- 2.2 General weather conditions during the visit on the 06th were mild and cloudy, rain had preceded the site visit so ground conditions were slightly wet. General weather conditions during the visit on the 22nd were very wet, with constant rain throughout the day.
- 2.3 Water was not present at site 1, and therefore no measurements or samples were taken. All other sites had flowing water present and monitoring took place at sites 2, 3, 4 and 5.
- 2.4 Pictures of the sites and conditions can be found in Appendix B.

Flow Monitoring

- 2.5 A Valeport Model 801 Electromagnetic Flowmeter was inserted into the river at multiple locations across the width of the river to give a range of flow across the river profile. Flow and depth were determined at each transect point to calculate an overall stream profile and discharge rate. The number of transects and measurements taken at each site varied depending on river width, and minimum of 5 were taken for each site.
- 2.6 Schematics and river profiles at each monitoring point, with flow recordings at each position are attached in Appendix C.

Water quality Monitoring

- 2.7 In-situ monitoring was conducted using a Hanna Multiparameter probe. The multiparameter probe was inserted directly into the river at the sample site location where parameters measured include conductivity, pH, temperature, dissolved oxygen and salinity.
- 2.8 To prevent cross contamination, the multiparameter probe was rinsed thoroughly at each location using water from downstream at the next sampling point and stored in a calibration fluid.

Water quality Sampling

- 2.9 Water samples were collected for each site: 2, 3, 4 and 5. The samples were kept in a suitable container whilst on and off site and sent to an accredited laboratory for further analysis.

3 **River Profile and Flow rates**

- 3.1 Whilst recording flow, the depth of the river channel was recorded. Site 1 was recorded as dry for both site visits. A general observation is that the river channel gradually got wider and deeper from site 1 to 5 which was expected.
- 3.2 Due to the heavy rainfall throughout the day on the 22nd, rising water levels during the monitoring process was noted.
- 3.3 The high discharge rates recorded on 22nd February, compared with the 06th, were as a result of heavy rainfall the previous day and on the day of monitoring.
- 3.4 The discharge rate increased throughout the sites on the 06th and the 22nd.
- 3.5 The table below summarises the flow and discharge recorded at each site, however, further data can be found in Appendix C.
- 3.6 Using the flow profiles from onsite monitoring, the discharge (m³/s) has been calculated and displayed in Table 1.

Table 1: Discharge Analysis for both site visits in February

Site	Discharge (06/02/2024)	Discharge (22/02/2024)
1	NA	NA
2	0.002 m ³ /s	0.02 m ³ /s
3	0.008 m ³ /s	0.04 m ³ /s
4	0.025 m ³ /s	0.19 m ³ /s
5	0.026 m ³ /s	0.58 m ³ /s

4 **Water Quality- In-Situ monitoring**

- 4.1 The following section summarises the in-situ water quality parameters that were recorded on site. For robustness, the below measurements consist of 2 spot samples taken after the multiparameter probe had been correctly calibrated and 'settled'.

Temperature

- 4.2 The temperature at each site 2, 3, 4 and 5 was consistent for both site visits, with an average of approximately 9°C.

Dissolved Oxygen (DO) (mg/l and % saturation)

- 4.3 The dissolved oxygen concentrations ranged between 3.65 ppm and 5.77 ppm, and 32.45% and 52.4%, across both site visits. The lowest concentrations were found at Site 5 and the highest at Site 2, for both site visits.

Conductivity

- 4.4 Specific conductivity was recorded between 342 $\mu\text{S/cm}$ and 847 $\mu\text{S/cm}$ over the four sites sampled, with decreased readings further downstream. The decrease in conductivity from site 2 to site 5 may be a direct correlation with the decrease in salinity from site 2 to 5, for both site visits.

pH

- 4.5 The pH had a noticeably small range from 7.46 to 8.27. The lower ranges were recorded at site 5 and the higher at site 2.

Salinity

- 4.6 Salinity was very consistent along the river, as expected. Measurements ranged from 0.16 psu to 0.26 psu for the site visit on the 22nd, and 0.27 psu and 0.38 psu for the site visit on the 06th.

Visual and Odour observations

- 4.7 There were no odours recorded at any of the sampling locations, however, thick silt was noted recorded on channel beds at all sites.
- 4.8 Chennel beds were not visible due to the high turbidity, likely a result of preceding rainfall and surface water runoff. It was ensured that any water quality samples (in-situ or laboratory) were collected upstream of the flow monitoring transect.
- 4.9 Please see table below for a summarised view of the in-situ water quality measurements.

Table 2: In-Situ Monitoring results

Site (06/02/24)	Time	Temperature (°C)	pH	ORP (mV)	EC ($\mu\text{S/cm}$)	Sal (psu)	DO (%)	DO (ppm)
2	11:27:50	8.82	8.19	101.4	765.5	0.38	47.95	5.5
3	12:03:18	9.27	8.27	103.2	847	0.42	50.4	5.7
4	12:39:51	9.39	7.71	13.4	694	0.34	46.3	5.23
5	13:23:01	9.68	7.49	86.4	561	0.27	32.45	3.65
Site (22/02/24)	Time	Temperature (°C)	pH	ORP (mV)	EC ($\mu\text{S/cm}$)	Sal (psu)	DO (%)	DO (ppm)
2	11:26:43	9.03	7.55	11.05	531.5	0.26	48.25	5.36
3	12:21:32	9.27	7.68	27.7	562	0.27	52.4	5.77
4	12:59:33	9.36	7.56	32.1	425.5	0.21	50.8	5.57
5	13:57:44	9.44	7.46	36.05	342	0.16	45.15	4.95

5 Water Quality- Laboratory Chemical Analysis

- 5.1 The surface water chemical analysis results are summarised below. Please note that no water quality samples were taken at site 1 as this was recorded as dry.

Table 3: Analytical Test Results

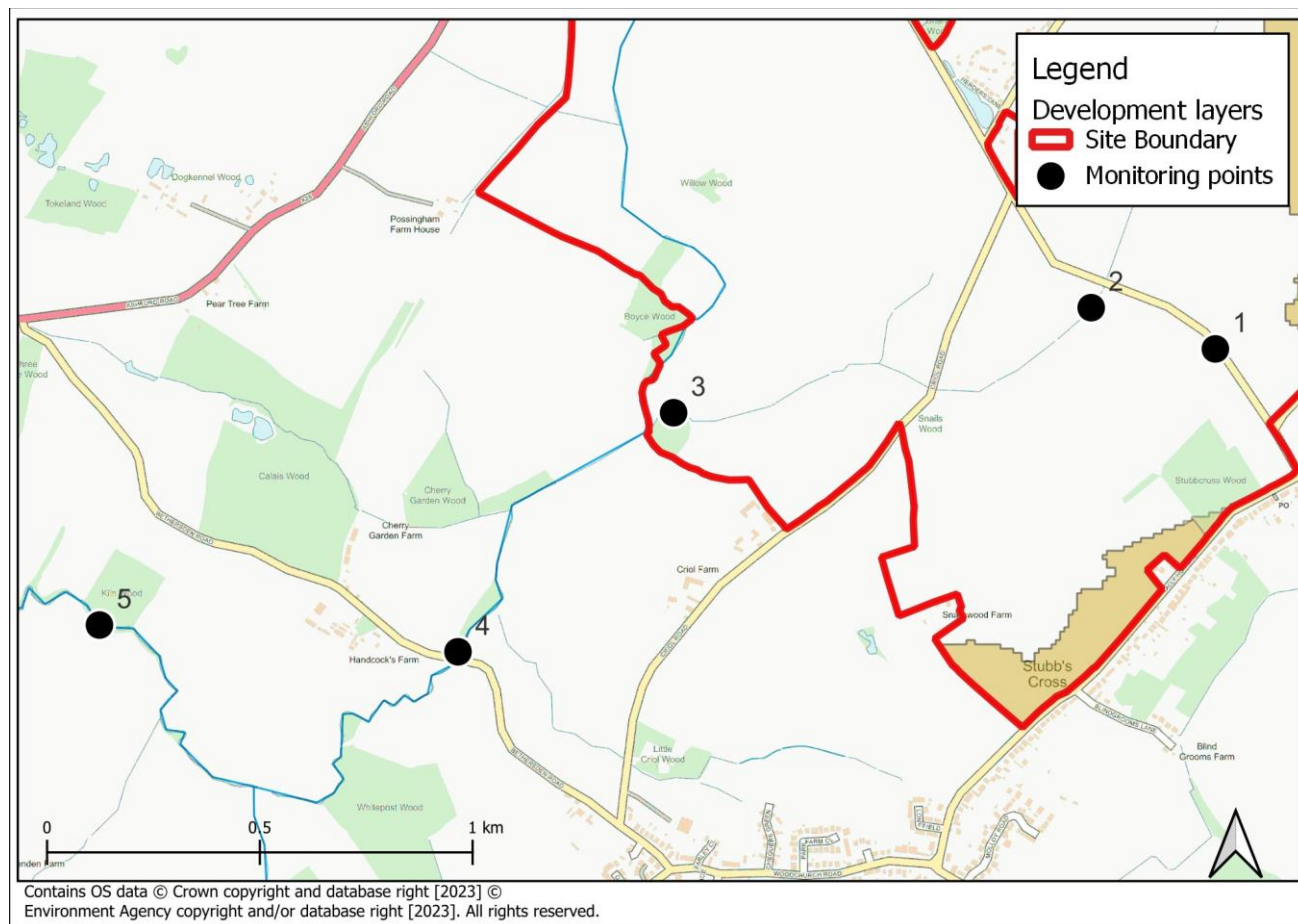
Parameter (06/02/2024)	Site 1	Site 2	Site 3	Site 4	Site 5
Biological Oxygen Demand BOD (mg/l)	NA	1	1	2	1
Alkalinity as CaCO₃ (mg/l)	NA	258	278	174	153
Total Suspended Solids (mg/l)	NA	13	19	<10	19
Ammoniacal Nitrogen as N (mg/l)	NA	<0.05	<0.05	0.07	0.07
Nitrite (mg/l)	NA	0.1	0.1	0.1	0.1
Nitrite as N (mg/l)	NA	0.03	0.03	0.04	0.04
Nitrate (mg/l)	NA	37	29.9	17.6	10.7
Nitrate as N (mg/l)	NA	8.342	6.753	3.983	2.410
Nitrogen, Oxidised Nitrogen (mg/l)	NA	8.4	6.8	4	2.4
Total Nitrogen (mg/l)	NA	12.4	7.5	4.9	3.3
Orthophosphate PO₄ (mg/l)	NA	0.4	0.2	0.13	0.19
Total Phosphorus (µg/l)	NA	129	82	77	85
Parameter (22/02/2024)	Site 1	Site 2	Site 3	Site 4	Site 5
Biological Oxygen Demand BOD (mg/l)	NA	<1	<1	<1	<1
Alkalinity as CaCO₃ (mg/l)	NA	210	199	119	95
Total Suspended Solids (mg/l)	NA	45	45	67	163
Ammoniacal Nitrogen as N (mg/l)	NA	0.21	0.11	0.13	0.21
Nitrite (mg/l)	NA	<0.1	<0.1	<0.1	<0.1
Nitrite as N (mg/l)	NA	<0.03	<0.03	<0.03	<0.03
Nitrate (mg/l)	NA	33.3	18.9	10.4	7.1
Nitrate as N (mg/l)	NA	7.527	4.268	2.337	1.592
Nitrogen, Oxidised Nitrogen (mg/l)	NA	7.5	4.3	2.4	1.6
Total Nitrogen (mg/l)	NA	8.0	4.7	3.1	2.4
Orthophosphate PO₄ (mg/l)	NA	0.28	0.17	0.13	0.23
Total Phosphorus (µg/l)	NA	134	109	118	204

- 5.2 For the site visit on the 06th Total Phosphorus decreased from 129 µg/l to 85 µg/l. For the site visit on the 22nd, there was no notable pattern for Total Phosphorus, the highest value was found at site 5 at 204 µg/l. The overall values were much higher for the second site visit when comparing the two.
- 5.3 Total Nitrogen decreased considerably from site 2 to site 5 on both monitoring dates.
- 5.4 The values for Total Suspended Solids were lower for the site visit on the 06th compared with the site visit on the 22nd. This was because heavy rainfall was consistent throughout the site visit on the 22nd, water levels were higher than usual and were extremely silty.

6 Summary of Monitoring

- 6.1 This report is one of a series of monitoring reports on the River Beult. This will assist in forming baselines that will be compared to future monitoring at the respective sites.

Appendix A: Figures



Appendix B: Photographs



Site 2: Stream next to field hedge row (06/02/24)



Site 2: Stream next to field hedge row (22/01/24)



Site 3: Stream prior to joining adjacent River Beult tributary. (06/02/24)



Site 3: Stream prior to joining adjacent River Beult tributary. (22/02/24)



Site 4: Upper River Beult near Bethersdon Road (06/02/24)



Site 4: Upper River Beult near Bethersdon Road (22/02/24)



Site 5: Near Kiln Wood Public Right of Way (06/02/24)



Site 5: Near Kiln Wood Public Right of Way (22/02/24)

Appendix C: River Cross section profiles

