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PROJECT	Chilmington Green Ashford, Kent		CLIENT	Hodson Developments			
TITLE	River Beult Monitoring April 2024		REFERENCE	22074-SVY-TN-07		P01	
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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 Appendix A. It must be noted that site 1 has been excluded from the monitoring plan as it has been deemed unsuitable for monitoring or as a point of discharge for the proposed Chilmington Green WwTW. Therefore, Site 2 is considered the next suitable point of discharge.
- 1.5 Monitoring results are presented in a monthly report, with a final report issued on the completion of the monitoring study.
- 1.6 This report will summarise two rounds of sampling as two site visits were undertaken in April.

2 Monitoring and Sampling Methodology

- 2.1 Water Environment undertook water quality and flow monitoring 04th and the 18th of April 2024.
- 2.2 General weather conditions during the visit on the 04th were cold and rainy, the site visit was preceded by heavy rainfall the day before, therefore ground conditions were wet. General weather conditions during the visit on the 18th were mild and sunny, with scattered colds. Ground conditions were dry.
- 2.3 All sites (excluding 1) had flowing water present, and the following measurements and samples were taken for 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 vary depending on river width, but a minimum of 5 was 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 at all sites. Samples were stored 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 The discharge rate was higher during the site visit on the 04th compared with the 18th this was because of the heavy rainfall that occurred on the previous the day and on the day of the 04th.
- 3.3 The discharge rate increased through the sites for both site visits on the 04th and the 18th.
- 3.4 The table below summarises the flow and discharge recorded at each site, however, further data can be found in Appendix C.
- 3.5 Using the flow profiles from onsite monitoring, the discharge (m³/s) has been calculated and displayed in Site 5 on the 18th was exceptionally slow flowing with evidence of debris in the river downstream. This was noted due to the significant difference in discharge between the two monitoring periods.
- 3.6 **Table 1.** Site 5 on the 18th was exceptionally slow flowing with evidence of debris in the river downstream. This was noted due to the significant difference in discharge between the two monitoring periods.

Table 1: Discharge Analysis for both site visits in April

Site	Discharge (04/04/2024)	Discharge (18/04/2024)
1	NA	NA
2	0.03 m ³ /s	0.001 m ³ /s
3	0.13 m ³ /s	0.005 m ³ /s
4	0.43 m ³ /s	0.009 m ³ /s
5	1 m ³ /s	0.011 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 the purpose of reliability, the below examples consist of 2 spot samples taken after the multiparameter probe had been correctly calibrated and 'settled'. Samples were taken for sites 2, 3, 4 and 5.

Temperature

- 4.2 The temperature ranged from 9.99°C to 11.18°C (04/04/2024) and from 7.82°C to 9.34°C (18/04/2024).

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

- 4.3 The dissolved oxygen concentrations ranged between 5.71 ppm and 7.85 ppm, and 49.85% and 67.27%, across both site visits. The concentrations decreased from site 2 to site 5, for both site visits.

Conductivity

- 4.4 Specific conductivity was recorded between 292 $\mu\text{S/cm}$ and 930 $\mu\text{S/cm}$. The general trend was that conductivity decreased from sites 2 to 5 for both site visits. 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. The conductivity and salinity were notably high at site 3 for the visit on the 18th.

pH

- 4.5 The pH had a noticeably small range from 7.11 to 8.24.

Salinity

- 4.6 Salinity was relatively consistent along the river, as expected. Measurements ranged from 0.14 psu to 0.24 psu for the site visit on the 04th, and 0.28 psu and 0.46 psu for the site visit on the 18th.

Visual and Odour observations

- 4.7 There were no odours recorded at any of the sampling locations. The channel beds at sites 2, 3, 4 and 5 were extremely silty for the site visit on the 04th and relatively clear for the site visit on the 18th. Therefore, visually the water can appear to be a silted colour when walking in the channel to record flow measurements. It was ensured that any water quality samples (in-situ or laboratory) were collected upstream of the flow monitoring transect.
- 4.8 Please see table below for a summarised view of the in-situ water quality measurements.

Table 2: In-Situ Monitoring results

Site (04/04/24)	Time	Temperature (°C)	pH	ORP (mV)	EC ($\mu\text{S/cm}$)	Sal (psu)	DO (%)	DO (ppm)
2	11:34:13	9.99	7.11	42.75	500	0.24	56.1	6.21
3	12:26:33	10.51	7.3	50	459	0.22	55.7	6.1
4	12:55:51	10.98	7.14	54.25	331	0.16	54.3	5.88
5	13:43:24	11.18	7.19	55.5	292	0.14	56.7	6.13
Site (18/04/24)	Time	Temperature (°C)	pH	ORP (mV)	EC ($\mu\text{S/cm}$)	Sal (psu)	DO (%)	DO (ppm)
2	10:47:34	7.82	8.23	19	791	0.39	65.7	7.85
3	11:21:42	8.59	8.24	41.9	930	0.46	67.27	7.85
4	12:01:52	9.37	7.6	49.3	758	0.37	66.35	7.59
5	12:46:53	9.34	7.51	53.6	581	0.28	49.85	5.71

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 (point of discharge) as this was recorded as dry.

Table 3: Analytical Test Results

Parameter (04/04/2024)	Site 1	Site 2	Site 3	Site 4	Site 5
Biological Oxygen Demand BOD (mg/l)	NA	2	5	5	5
Alkalinity as CaCO ₃ (mg/l)	NA	190	153	94	76
Total Suspended Solids (mg/l)	NA	73	96	110	90
Ammoniacal Nitrogen as N (mg/l)	NA	0.24	0.45	0.36	0.32
Nitrite (mg/l)	NA	0.6	1	0.5	0.2
Nitrite as N (mg/l)	NA	0.19	0.3	0.16	0.05
Nitrate (mg/l)	NA	28.7	17.4	15	10.7
Nitrate as N (mg/l)	NA	6.484	3.927	3.394	2.425
Nitrogen, Oxidised Nitrogen (mg/l)	NA	6.7	4.2	3.6	2.5
Total Nitrogen (mg/l)	NA	7.7	5.2	4.5	3.4
Orthophosphate PO ₄ (mg/l)	NA	<0.02	<0.02	<0.02	0.11
Total Phosphorus (µg/l)	NA	128	114	124	195
Parameter (18/04/2024)	Site 1	Site 2	Site 3	Site 4	Site 5
Biological Oxygen Demand BOD (mg/l)	NA	<1	<1	<1	<1
Alkalinity as CaCO ₃ (mg/l)	NA	333	264	229	189
Total Suspended Solids (mg/l)	NA	24	13	12	17
Ammoniacal Nitrogen as N (mg/l)	NA	0.06	0.1	0.09	0.12
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	34.5	21.1	11.6	6.5
Nitrate as N (mg/l)	NA	7.788	4.755	2.623	1.470
Nitrogen, Oxidised Nitrogen (mg/l)	NA	7.8	4.8	2.6	1.5
Total Nitrogen (mg/l)	NA	8.5	5.7	3.6	2.5
Orthophosphate PO ₄ (mg/l)	NA	0.24	<0.02	0.16	<0.02

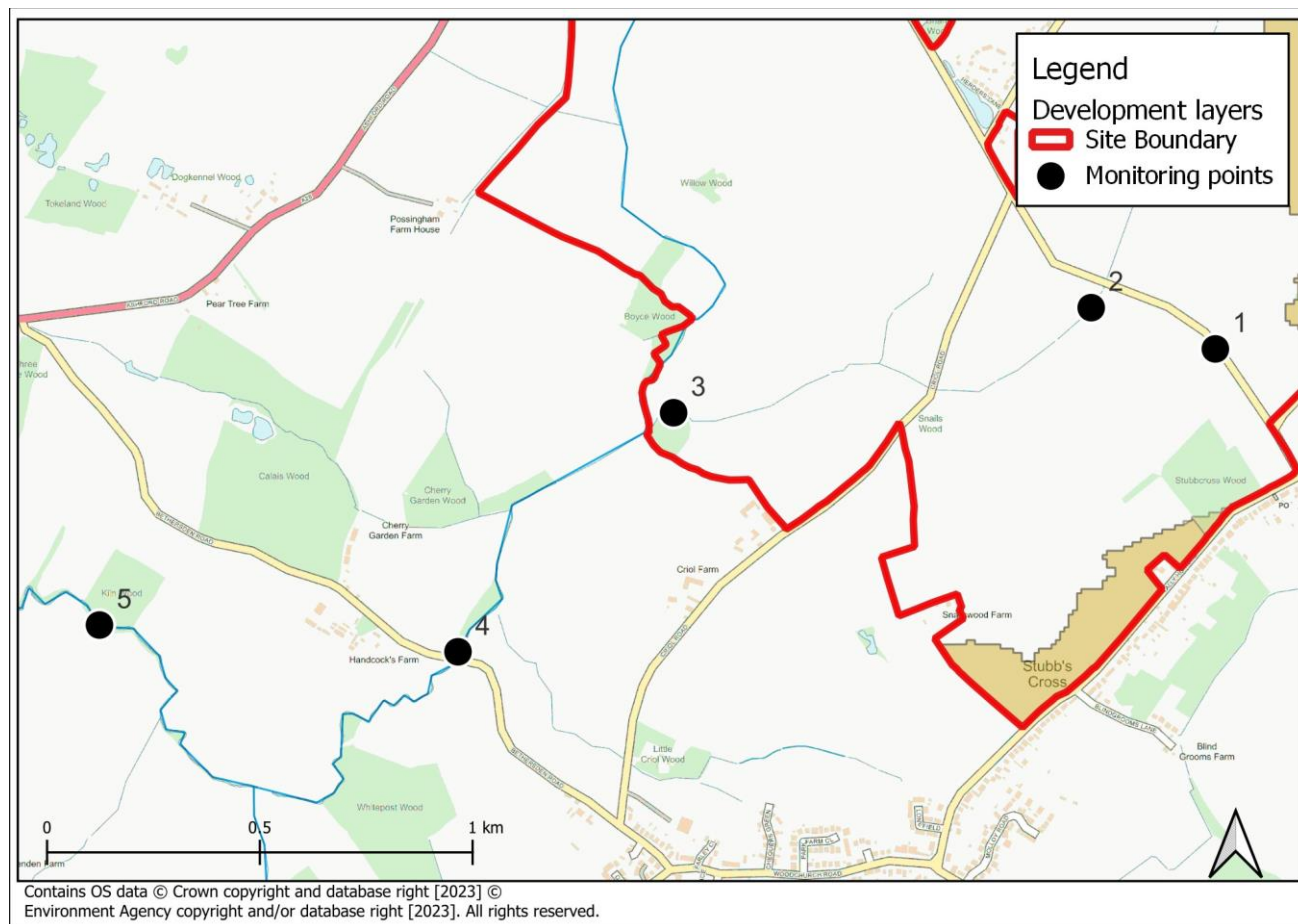
Total Phosphorus (µg/l)	NA	127	47	54	55
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- 5.2 Total Nitrogen decreased from site 2 to site 5 for both site visits.
- 5.3 Total Phosphorus was considerably lower across sites 3, 4 and 5 for the site visit on the 18th compared to the 04th. For site 2 the values were similar for both site visits.

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.
- 6.2 Variation in water levels and flow quantity are evident during wet and dry periods.

Appendix A: Figures



Appendix B: Photographs



Site 2: Stream next to field hedge row (04/04/24)



Site 2: Stream next to field hedge row (18/04/24)



Site 3: Stream prior to joining adjacent River Beult tributary. (04/04/24)



Site 3: Stream prior to joining adjacent River Beult tributary. (18/04/24)



Site 4: Upper River Beult near Bethersdon Road (04/04/24)



Site 4: Upper River Beult near Bethersdon Road (18/04/24)



Site 5: Near Kiln Wood Public Right of Way (04/04/24)



Site 5: Near Kiln Wood Public Right of Way (18/04/24)

Appendix C: River Cross section profiles

