Central Bedfordshire Council Local Plan (2015-2035)

Water Cycle Study

Appendix A-C

(July 2017)

A Appendix: Water Quality Assessment

A Appendix - Water Quality Assessment

A.1 Introduction

The increased discharge of effluent due to a growth in population served by a Wastewater Treatment Works (WwTW)[1] may impact the quality of the receiving water. The Water Framework Directive (WFD) does not allow a watercourse to deteriorate from its current class (either water body or element class).

It is Environment Agency (EA) policy to model the impact of increasing effluent volumes on the receiving watercourse. Where the scale of development is such that a deterioration is predicted, a new Environmental Permit (EP) may be required for the WwTW to improve the quality of the final effluent, so that the extra pollution load will not result in a deterioration in the water quality of the watercourse. This is known as a "no deterioration" or "load standstill".

It is the objective of the WFD that all waterbodies should meet Good Ecological Status (GES), or where they have been highly modified meet Good Ecological Potential (GEP). It is therefore also necessary to assess whether the proposed increase in effluent could prevent a watercourse from meeting GES or GEP.

If a watercourse fails the GES target, further investigations are needed to define the 'reasons for fail' and which actions could be implemented to reach such status.

As Central Bedfordshire Council has not provided growth numbers or locations at this stage, each WwTW was investigated to determine how many houses can be built with the current treatment technology without causing a deterioration of 10% or more, or a class deterioration. This analysis identified 18 Wastewater Treatment Works (WwTWs) to assess the current capacity of the systems, however two of these (Caddington and Studham) discharge to groundwater and were consequently not assessed (see section A.2.9). The EA has reviewed the list of WwTWs and recommended analysis of the following 16 treatment works:

- Anglian Water
  - Barton Le Clay
  - Biggleswade
  - Chalton
  - Clifton
  - Clophill
  - Dunstable
  - Flitwick
  - Leighton Linslade
  - Marston Moretaine (Level 2 only)
  - Poppy Hill
  - Potton
  - Sandy
  - Shillington
  - Stanbridgeford
  - Tempsford
- Thames Water
  - Markyate

This report assesses the current potential growth in the WwTWs without reaching deterioration.

A.1.1 Study Objectives

This report assesses the potential water quality impacts on the receiving watercourses due to the future growth in effluent flows. The aim of this assessment was to identify how many potential houses could be developed within each WwTW catchment, without causing deterioration and

1 Note that Anglian Water now uses the terminology water Recycling Centres (WRCs) to underline the role of treatment works in recycling water to the natural environment. The term wastewater and wastewater treatment is used generically in this report and applies both to Thames Water and Anglian Water assets.

without upgrading the WwTW. Note that available headroom capacity has been assessed for three measures:

- flow capacity against the Dry Weather Flow consent (presented in the main report),
- environmental capacity in the receiving watercourse (presented in detail in this appendix and summarised in the main report), and
- impact on additional effluent flows on flood risk in the receiving watercourse (presented in the main report).

A.2 Methodology

A.2.2 Growth Scenarios

In order to undertake this assessment, future effluent flows needed to be estimated to determine the number of additional houses that could be developed without causing deterioration. This was carried out through an iterative process, whereby the effluent flow (mean and standard deviation) were increased in increments, and the resulting water quality compared to the present day quality. Where this did not result in a deterioration, the effluent flow was repeated until deterioration was predicted. This test was repeated for the three determinands (BOD, NH_4 and P). Note that a cap of three times the present day effluent flow was applied. It is reasonable to assume that very few treatment works would be able to accommodate a three times increase in effluent without requiring an upgrade.

The final future effluent statistics were then used to estimate the number of houses using the following parameters:

- Anglian Water: an occupancy rate of 2.4 persons/dwelling, a water consumption of 133 l/p/d and 95% of water consumed being returned to sewer.
- Thames Water: an occupancy rate of 2.4 persons/dwelling, a water consumption of 125l/p/d and 95% of water consumed being returned to sewer.

A.2.3 Assessment of Deterioration

The Water Cycle Study is intended to, where possible, direct growth where there is infrastructure and environmental capacity to accommodate it, and to ensure that growth does not degrade the environment. Any increase in a pollutant load being discharged from a WwTW could cause a deterioration in the water quality of the receiving water body, and a review of the Environmental Permit may be triggered and an upgrade to the treatment work may be necessary. The EA set the following criteria to define significant deterioration:

- A class deterioration: For example, if an increased load of ammonia from a WwTW led to a water body currently defined as "Fair" ecological status dropping down to "Poor" status.
- A deterioration of more than 10%. For example, if the present-day 95 percentile BOD downstream of a WwTW is 2.0mg/l, but as a result of an increased WwTW discharge this rose to 2.3mg/l, this would be a deterioration of 15%.
- Any deterioration of a water body classed as "Bad". Where the water body is currently of "Bad" ecological status (the lowest WFD status), then no further deterioration is permitted.

A.2.4 Improving water quality to enable Good status to be met

Where a water body is currently not meeting good status, activities which impact upon that water body should be assessed to ensure that they will not prevent the water body from meeting Good status in the future. When assessing WwTW discharges, this means testing whether the water body could meet good status, if the upstream water quality were good and the treatment works were to be upgraded to current Best Available Technology (BAT). If it could, but the planned growth in the catchment would prevent Good status being met, it is considered that environmental capacity could be a limitation on growth.

This assessment has not been carried out at this early stage in the Central Bedfordshire assessment, due to:

- no information being available on the likely scale and locations of development
- the focus of this assessment being to identify the scale of development which could be accommodated in each catchment without causing deterioration and without requiring a treatment works upgrade.

This assessment will be included at stage 2.

A.2.5 River Quality Planning Tool

The Environment Agency RQP tool was the selected approach for this assessment in conjunction with the recommended guidance document; "Water Quality Planning: no deterioration and the Water Framework Directive"[2]. The tool uses a Monte Carlo Mass Balance approach which allows the user to both test the impact of a change in discharge volume or quality and to calculate Environmental Permit conditions needed to achieve a downstream water quality target.

RQP models were set up and run for each WwTW to determine the current impact of the treatment works.

The data required to run the RQP software were:

Upstream river data (received from the EA):

- Mean flow
- 95% exceedance flow
- Mean for each contaminants
- Standard deviation for each contaminant

Discharge data (received from the EA):

- Mean flow
- Standard deviation for the flow
- Mean for each contaminant

River Quality target data (received from the EA):

- 'No deterioration target'
- 'Good status' target

The above data inputs should be based on observations where available. In the absence of observed data, the EA require that the following values are used:

- Flow mean: 1.25*DWF
- Flow SD: 1/3*mean
- Quality data: permit values or assumed values
- If observed river flows were not available these were obtained from an existing model or low-flows estimation software.
- If observed water quality data were not available these were obtained from an existing model or a neighbouring catchment with similar characteristics, or the mid-point of the WFD class.
- Dry Weather Flow (DWF) permits and the measured Q90 flows were also provided by the EA.

Note that, for the 14 treatment works within the Environment Agency's Anglian Region, spreadsheets summarising the recommended model input values and standards were provided by the EA. These are reproduced in Annex I. For the Markyate treatment works in the Thames region, the EA provided tabulated flow and water quality observed data. These were analysed to produce input statistics for the RQP model.

A.2.6 Determinants

The determinants assessed at each WwTW were Biological Oxygen Demand (BOD), Ammonia (NH_4) and Phosphorus (P). It has been assumed that, as effluent volumes increase due to growth, each treatment works would continue to discharge at its present-day effluent quality (in other words that there would be no decline in the level of treatment as the works treats more wastewater).

A.2.7 Good Ecological Status

The WFD standards for Biological Oxygen Demand (BOD), Ammonia (NH_4) and Phosphorus (P) set by the EA for lowland and high alkalinity water bodies are shown in Table 1 below.

2 Environment Agency (2012) Water Quality Planning: no deterioration and the Water Framework Directive Accessed online at: http://www.fwr.org/WQreg/Appendices/No_deterioration_and_the_WFD_50_12.pdf 02/11/2016

Table 1: WFD Standards for Lowland and high Alkalinity water bodies

Determinand	Statistic (unit)	Standard (by class)			
		High	Good	Moderate	Poor
BOD	90 percentile (mg/)	4.0	5.0	6.0	7.5
NH_4	90 percentile (mg/l)	0.3	0.6	1.1	2.5
P	Mean (mg/l)	0.05	0.12 (Reach specific values shown below)	0.25	1.00

The EA has provided 2015 WFD catchment/reach specific 'Good Status' targets for phosphorus. The following targets have been used in this assessment at each WwTW:

Table 2: Phosphorus targets for 'Good Status' by WwTW

WwTW	P mean mg/l	Receiving watercourse
Barton Le Clay	0.197	Barton Brook
Biggleswade	0.088	River Ivel
Chalton	0.075	River Flit
Clifton	0.089	Henlow Brook
Clophill	0.076	River Flit
Dunstable	0.075	Ouzel Brook
Flitwick	0.076	Steppingley Brook
Leighton Linslade	0.075	River Ouzel
Poppy Hill	0.09	River Ivel
Potton	0.07	Sutton Brook
Sandy	0.09	River Ivel
Shillington	0.086	Campton Brook
Stanbridgeford	0.076	Ouzel Brook
Tempsford	0.089	Stone Brook
Markyate	0.077	River Ver

A.2.8 Assessing Compliance

The status of the receiving watercourse is reported using the same traffic-colour used by the EA "Method Statement for the Classification of Surface Water Bodies v3"[3] as shown in

3 Environment Agency (2012) Method statement for the classification of surface water bodies v3 Accessed online at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/485389/LIT_5769_ed4e2b.pdf 02/11/2016

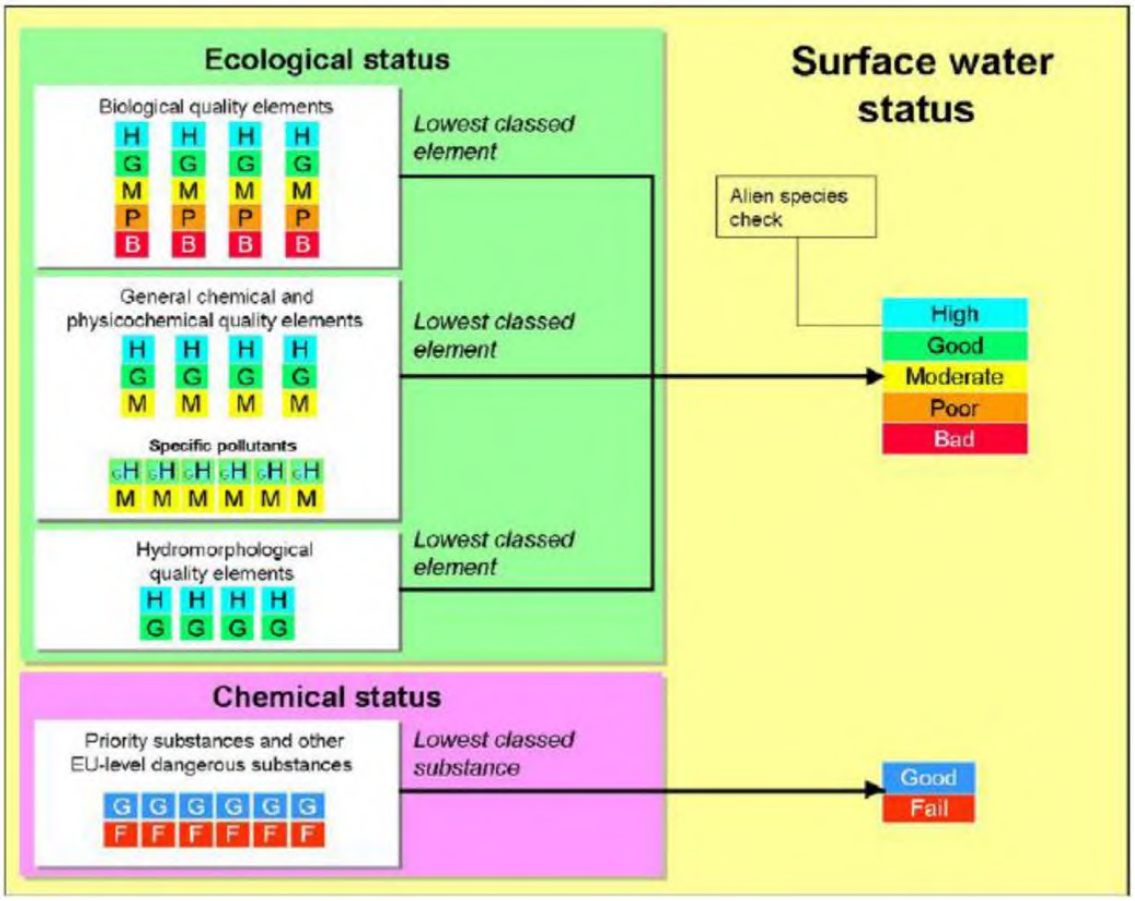
Figure 1. The WCS requires an assessment only based on the physico-chemical quality elements where each element is classified as bad, poor, moderate, good or high.

For each WwTW a summary table is provided (based on **Error! Reference source not found.**) for the receiving watercourse, reporting the 2015 WFD status for BOD, NH_4 and P, the overall status of the watercourse and future objectives.

Table 3: Summary table representing 2015 watercourse status and its objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Overall watercourse's status	Watercourse's status for BOD	Watercourse's status for NH_4	Watercourse's status for P
Objective	Overall watercourse's objective	Watercourse's objective for BOD	Watercourse's objective for NH_4	Watercourse's objective for P

Figure 1: Classification of Surface Water Status from "Method statement for the classification of surface water bodies v3"



A.2.9 Wastewater treatment works discharging to groundwater

Two wastewater treatment works at Caddington and Studham (both Thames Water) in Central Bedfordshire discharge to groundwater. If the proposed growth in either of these two catchments is anticipated to lead to an exceedance of the existing volumetric discharge permits, it would be necessary to undertake a groundwater risk assessment to demonstrate that the potential environmental impacts of the discharge are acceptable can be adequately mitigated. The Environment Agency provide guidance on how to undertake such an assessment[4].

Preparing such an assessment was beyond the scope of this stage 1 study. If significant development draining to either Studham or Caddington WwTW is proposed, it is recommended that the stage 2 study includes a groundwater impact assessment.

4 Environment Agency (2016) Groundwater risk assessment for your environmental permit. Accessed online at https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit on 12/12/2016.

A.3 Results for Anglian Water WwTWs

A.3.10 Barton Le Clay

Barton Le Clay WwTW discharges into Barton Brook watercourse as shown in Figure 2.

Figure 2: Barton Le Clay WwTW discharge location

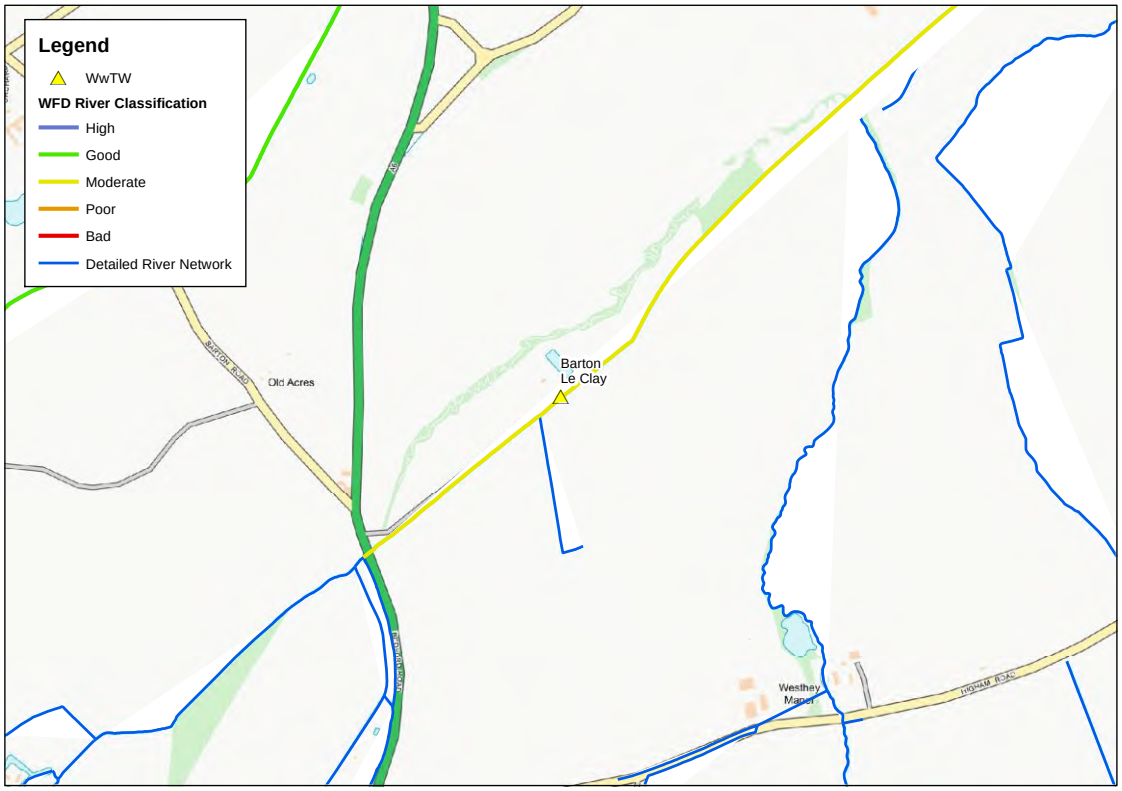


Table 4: Barton Brook status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	High	Poor
Objective	Not available	High	High	Good

Table 4 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Barton Le Clay has a moderate overall status, but BOD and NH_4 have a high status and P has a poor WFD status.

Table 5: Consent values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
1143	1094	15	6.09	5	3.43	Not available	n/a

Table 5 shows the consented values for Barton Le Clay WwTW. The works has permitted values for 2015 DWF, BOD and NH_4 and is currently working within these limits. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 6: Input data and RQP results for Barton Le Clay WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	2.748	Low Flow Software	1.43	Based on permitted DWF	N/A
	SD			0.48		
	5%ile	0.96				
BOD (mg/l)	Mean	1.15	Mid Class High	2.66	Observed Data (EA)	2.79
	SD	0.69		1.78		
	Target 90%ile	4.00	2015 WFD			
NH4 (mg/l)	Mean	0.09	Mid Class High	1.23	Observed Data (EA)	1.03
	SD	0.05		1.197		
	Target 90%ile	0.30	2015 WFD			
P (mg/l)	Mean	0.569	Mid Class Poor	5.21	Observed Data (EA)	2.32
	SD	0.569		1.20		
	Target Mean	1.058	2015 WFD			

Table 6 shows the input data and RQP results for Barton Le Clay. The model results indicate that BOD passes the target, whereas it fails the targets for both NH_4 and P.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 7 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. As deterioration of a water body classified as Bad is not permitted, no additional housing numbers can be allocated and therefore, no developments can be allocated to Barton Le Clay unless there is an upgrade to the treatment works to improve the water body status for Phosphorous.

Table 7: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	2.2	0.73	3.06	255
NH4	1.6	0.53	1.1	50
P	No Deterioration permitted			0

A.3.11 Biggleswade

Biggleswade WwTW discharges into the River Ivel as shown in Figure 3.

Figure 3: Biggleswade WwTW discharge location

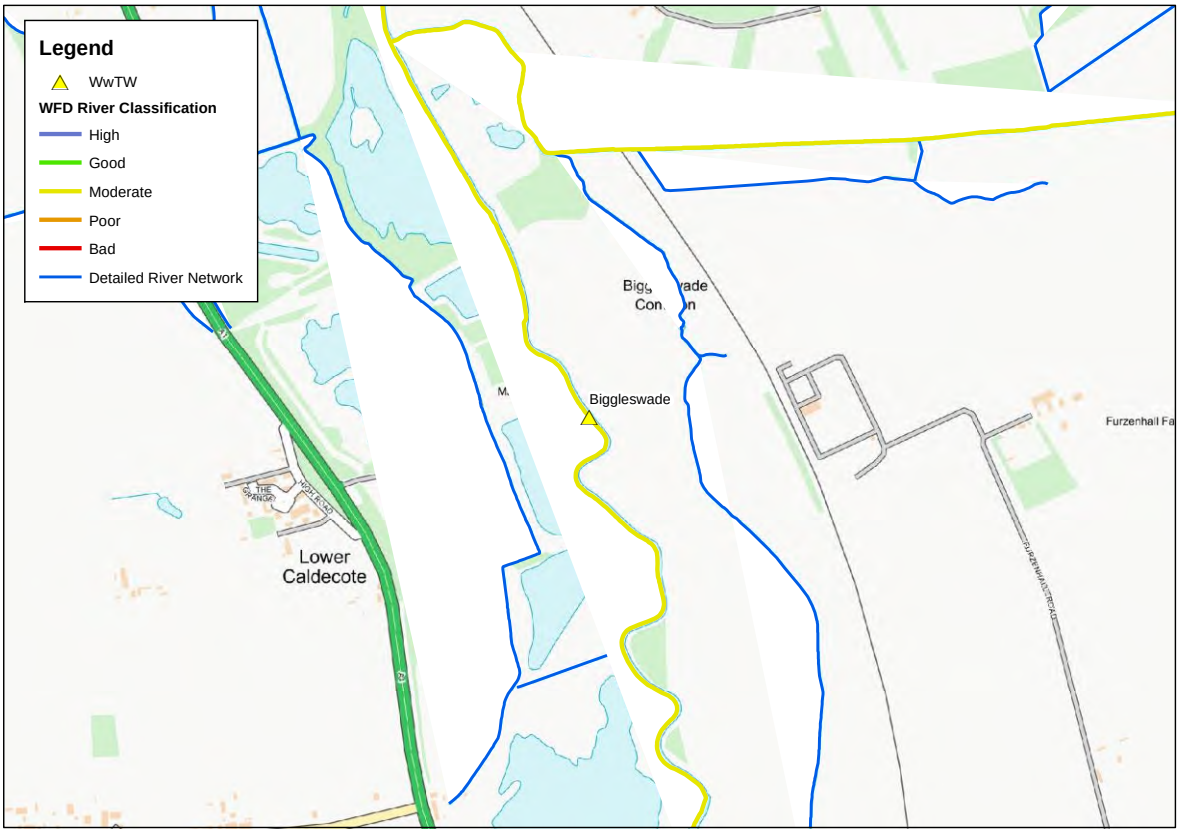


Table 8: The River Ivel status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	High	Moderate
Objective	Not available	High	High	Good

Table 8 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Barton Le Clay has a moderate overall status, but BOD and NH_4 have a high status and P has a moderate WFD status.

Table 9: Consent Values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
4100	3241	25	10.69	10	3.11	2	1.06

Table 9 shows the consented values for Biggleswade WwTW. The works has permitted values for 2015 DWF, BOD, NH_4 and P and is currently working within these limits. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 10: Input data and RQP results for Biggleswade WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	194.31	Low Flow Software	5.13	Based on permitted DWF	
	SD			1.71		
	5%ile	67.22				
BOD (mg/l)	Mean	1.28	Observed Data	5.34	Observed Data (EA)	2.21
	SD	0.67		2.77		
	Target 90%ile	4.00	2015 WFD			
NH4 (mg/l)	Mean	0.110	Observed Data	1.29	Observed Data (EA)	0.25
	SD	0.080		0.95		
	Target 90%ile	0.30	2015 WFD			
P (mg/l)	Mean	0.210	Observed Data	1.04	Observed Data (EA)	0.24
	SD	0.060		0.38		
	Target Mean	0.210	2015 WFD			

Table 10 shows the input data and RQP results for Biggleswade. The model results indicate that for BOD and NH_4 passes the WFD target, whereas it fails the target for P.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 11 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Ammonia is the limiting factor here, with an estimated environmental capacity of a maximum of 620 additional dwellings permissible, without improving the WwTW.

Table 11: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	15.6	5.2	2.44	3450
NH4	7	2.33	0.27	620
P	9	2	0.26	1280

A.3.12 Chalton

Chalton WwTW discharges into the River Flit as shown in Figure 4.

Figure 4: Chalton WwTW discharge location

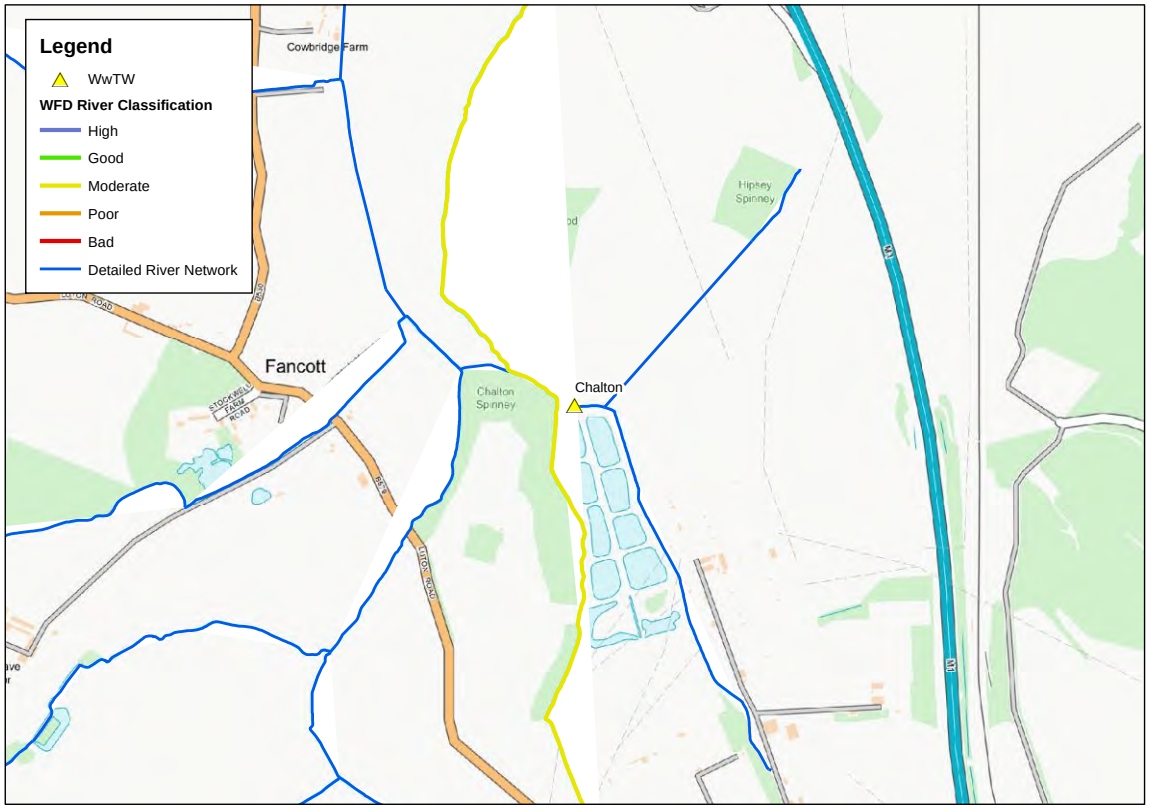


Table 12: River Flit status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	High	Poor
Objective	Not available	High	High	Good

Table 12 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Chalton has a moderate overall status, but BOD and NH_4 have a high status and P has a poor WFD status.

Table 13: Consent Values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
15,000	13,516	12	5.52	1	3.67	2	0.94

Table 13 shows the consented values for Chalton WwTW. The works has permitted values for 2015 DWF, BOD, and P and is currently working within these limits except for NH_4. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 14: Input data and RQP results for Chalton WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	1.037	Low Flow Software	18.75	Based on permitted DWF	
	SD			6.250		
	5%ile	0.432				
BOD (mg/l)	Mean	0.86	Observed Data	3.22	Observed Data (EA)	4.67
	SD	0.53		1.21		
	Target 90%ile	4.00	2015 WFD			
NH4 (mg/l)	Mean	0.040	Observed Data	1.78	Observed Data (EA)	2.94
	SD	0.040		0.98		
	Target 90%ile	0.30	2015 WFD			
P (mg/l)	Mean	0.607	Mid Class Poor	0.92	Observed Data (EA)	0.92
	SD	0.607		0.37		
	Target Mean	1.030	2015 WFD			

Table 14 shows the input data and RQP results for Chalton WwTW. The model results indicate that the present day effluent fails all of the pollutant targets.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 15Table 11 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Note that at this works, modelling indicated that up to three times the current mean effluent flow (the maximum value tested in this study) would be permissible. This is because the watercourse has a very small upstream catchment and therefore its flow and quality downstream of the treatment works is dominated by the effluent discharge. Consequently, discharging large volumes of additional effluent does not significantly detriment the water quality. If very large-scale development is proposed at stage 2, SIMCAT modelling of the downstream reaches should be considered.

However, as deterioration of a water body classified as Bad is not permitted, no additional housing numbers can be allocated to Chalton unless there is an upgrade to the treatment works to improve the water body status for Phosphorous.

Table 15: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	56.25	18.75	4.81	12400
NH4	56.25	18.75	3.05	12400
P	No Deterioration permitted			0

A.3.13 Clifton

Clifton WwTW discharges into Henlow Brook as shown in Figure 5.

Figure 5: Clifton WwTW discharge location

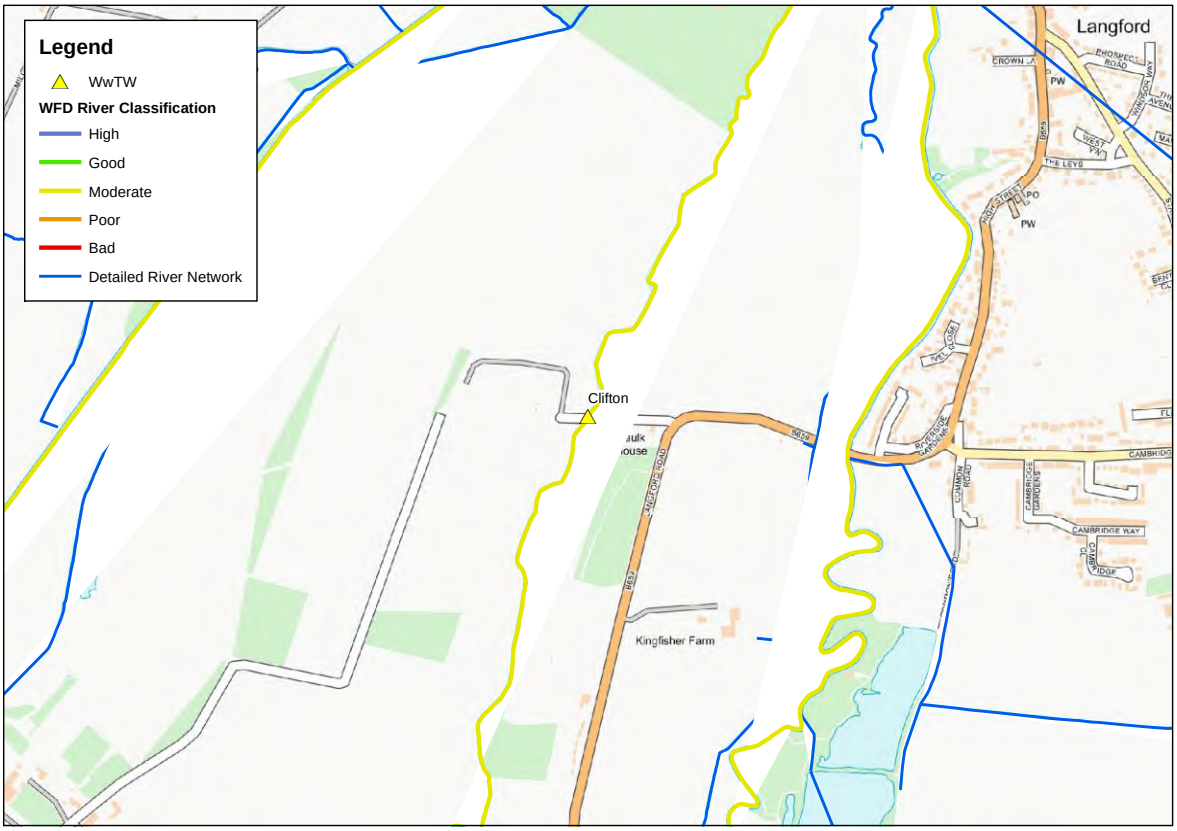


Table 16: Clifton status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	High	Poor
Objective	Not available	High	High	Good

Table 16 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Clifton has a moderate overall status, but BOD and NH_4 have a high status and P has a poor WFD status.

Table 17: Consent Values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
2931	2841	14	5.19	5	0.67	1	0.41

Table 17 shows the consented values for Clifton WwTW. The works has permitted values for 2015 DWF, BOD, NH_4 and P and is currently working within these limits. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 18: Input data and RQP results for Clifton WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	4.84	Flow Data	3.66	Based on permitted DWF	
	SD			1.22		
	5%ile	0.69				
BOD (mg/l)	Mean	1.14	Observed Data	1.84	Observed Data (EA)	2.91
	SD	1.09		1.83		
	Target 90%ile	4.00	2015 WFD			
NH4 (mg/l)	Mean	0.200	Observed Data	0.17	Observed Data (EA)	0.41
	SD	0.440		0.50		
	Target 90%ile	0.30	2015 WFD			
P (mg/l)	Mean	0.650	Mid Class Poor	0.40	Observed Data (EA)	0.53
	SD	0.650		0.43		
	Target Mean	1.091	2015 WFD			

Table 18 shows the input data and RQP results for Clifton WwTW. The model results indicate that BOD passes the current WFD target whereas NH_4 and P fail the targets.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 19 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Modelling at this works indicated that up to three times the current mean effluent flow (the maximum value tested in this study) would be permissible for NH_4 and P. This is because the watercourse has a very small upstream catchment and therefore its flow and quality downstream of the treatment works is dominated by the effluent discharge. Consequently, discharging large volumes of additional effluent does not significantly detriment the water quality. However, if very large-scale development is proposed at Stage 2, SIMCAT modelling of the downstream reaches should be considered.

Table 19: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	8.2	2.73	3.19	1500
NH4	10.98	3.66	0.41	2410
P	10.98	3.66	0.47	2410

A.3.14 Clophill

Clophill WwTW discharges into the River Flit as shown in Figure 6.

Figure 6: Clophill WwTW discharge location

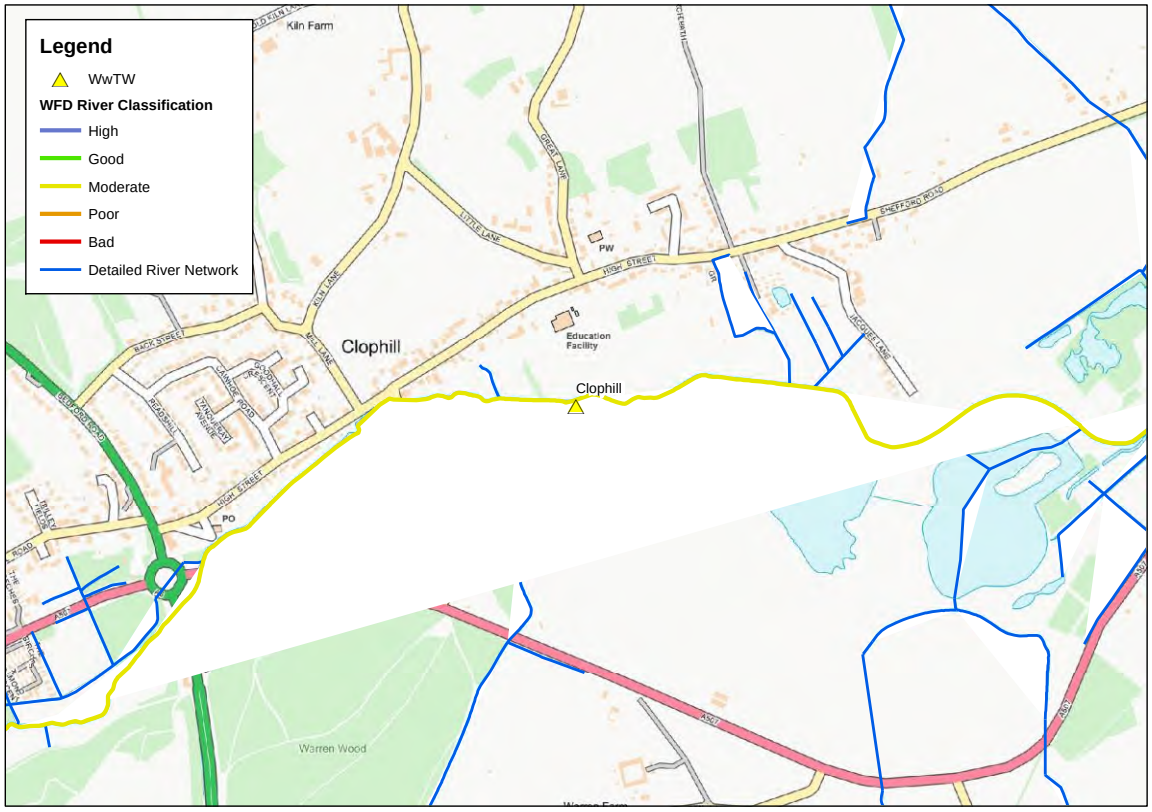


Table 20: River Flit status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	Good	Poor
Objective	Not available	High	Good	Good

Table 22 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Clophill has a moderate overall status, BOD has a high status whilst NH_4 has a good status.

Table 21: Consent values for DWF, BOD, NH_4

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
1800	1159	45	22.56	15	11.8	Not available	

Table 21 shows the consented values for Clophill WwTW. The works has permitted values for 2015 DWF, BOD and NH_4 and is currently working within these limits. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 22: Input data and RQP results for Clophill WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	46.20		2.25	Based on permitted DWF	
	SD			0.75		
	5%ile	19.20				
BOD (mg/l)	Mean	1.15	Mid Class High	15.63	Observed Data (EA)	2.83
	SD	0.69		7.73		
	Target 90%ile	4.00	2015 WFD			
NH4 (mg/l)	Mean	0.260	Mid Class Good	4.66	Observed Data (EA)	0.82
	SD	0.150		3.76		
	Target 90%ile	0.60	2015 WFD			
P (mg/l)	Mean	0.612	Mid Class Poor	7.06	Observed Data (EA)	0.96
	SD	0.612		1.09		
	Target Mean	1.036	2015 WFD			

Table 22 shows the input data and RQP results for Clophill WwTW. The model results indicate that BOD passes the current target whereas NH_4 and P fail the targets.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 23 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Ammonia is the limiting factor here, with an estimated environmental capacity of a maximum of 150 additional dwellings permissible, without improving the WwTW.

Table 23: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	2.85	0.95	3.09	200
NH4	2.7	0.9	0.9	150
P	3	1	1.06	250

A.3.15 Dunstable

Dunstable WwTW discharges into Ouzel Brook watercourse as shown in Figure 7.

Figure 7: Dunstable WwTW discharge location

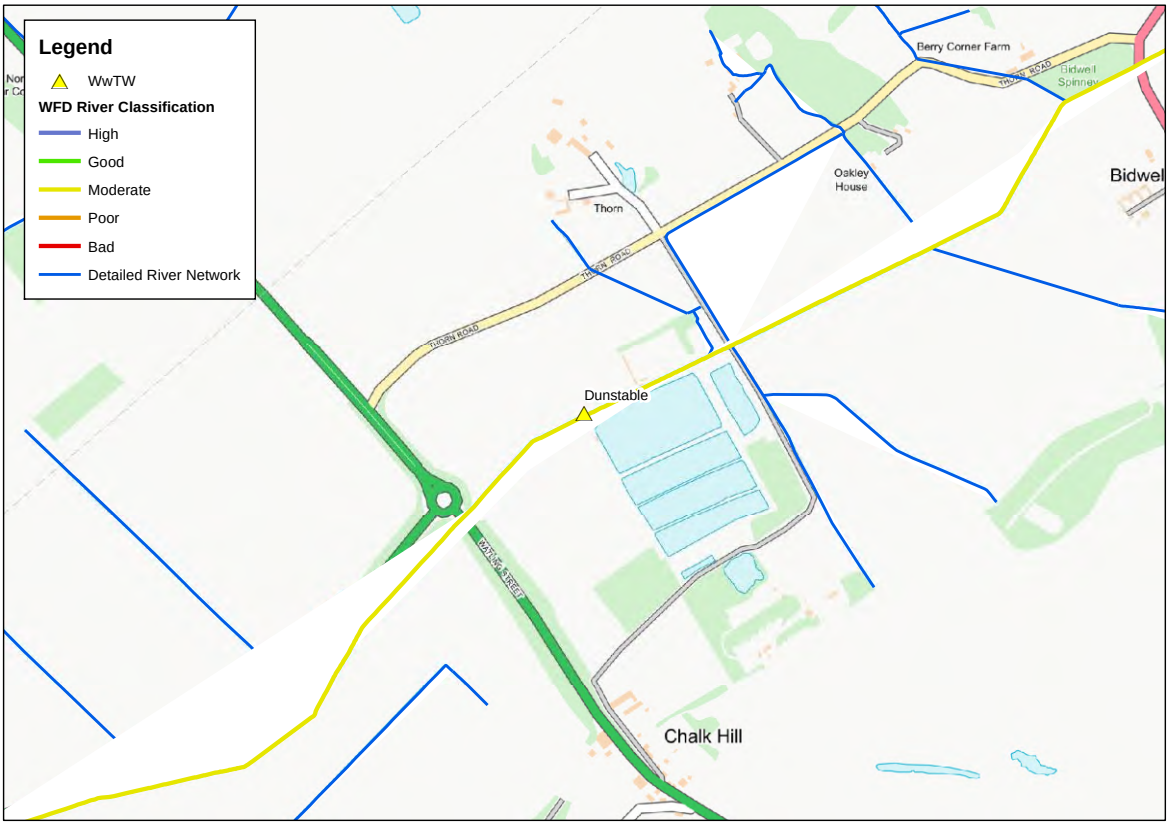


Table 24: Dunstable status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	High	Poor
Objective	Not available	High	High	Good

Table 24 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Dunstable has a moderate overall status, but BOD and NH_4 have a high status and P has a poor WFD status.

Table 25: Consent Values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
17,000	11,701	12	5.43	3	1.92	2	1.73

Table 25 shows the consent values for Dunstable WwTW. The works has permitted values for 2015 DWF, Bod, NH_4 and P and is currently working within these limits. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 26: Input data and RQP results for Dunstable WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	2.77	Low Flow Software	21.25	Based on permitted DWF	
	SD			7.08		
	5%ile	0.95				
BOD (mg/l)	Mean	2.20	Observed Data	2.59	Observed Data (EA)	4.32
	SD	2.66		1.47		
	Target 90%ile	4.00	2015 WFD			
NH4 (mg/l)	Mean	0.19	Observed Data	0.62	Observed Data (EA)	1.26
	SD	0.21		0.75		
	Target 90%ile	0.30	2015 WFD			
P (mg/l)	Mean	0.608	Observed Data	1.70	Observed Data (EA)	1.61
	SD	0.608		0.78		
	Target Mean	1.031	2015 WFD			

Table 26 shows the input data and RQP results for Dunstable. The model results indicate that none of the pollutants pass the current targets.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 27 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Modelling at this works indicated that up to three times the current mean effluent flow (the maximum value tested in this study) would be permissible. This is because the watercourse has a very small upstream catchment and therefore its flow and quality downstream of the treatment works is dominated by the effluent discharge. Consequently, discharging large volumes of additional effluent does not significantly detriment the water quality. If very large-scale development is proposed at Stage 2, SIMCAT modelling of the downstream reaches should be considered.

However, as deterioration of a water body classified as Bad is not permitted, no additional housing numbers can be allocated to Dunstable unless there is an upgrade to the treatment works to improve the water body status for Phosphorous.

Table 27: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	63.75	21.25	4.4	14050
NH4	63.75	21.25	1.35	14050
P	No Deterioration permitted			0

A.3.16 Flitwick

Flitwick WwTW discharges into the Steppingley Brook watercourse as shown in Figure 8.

Figure 8: Flitwick WwTW discharge location

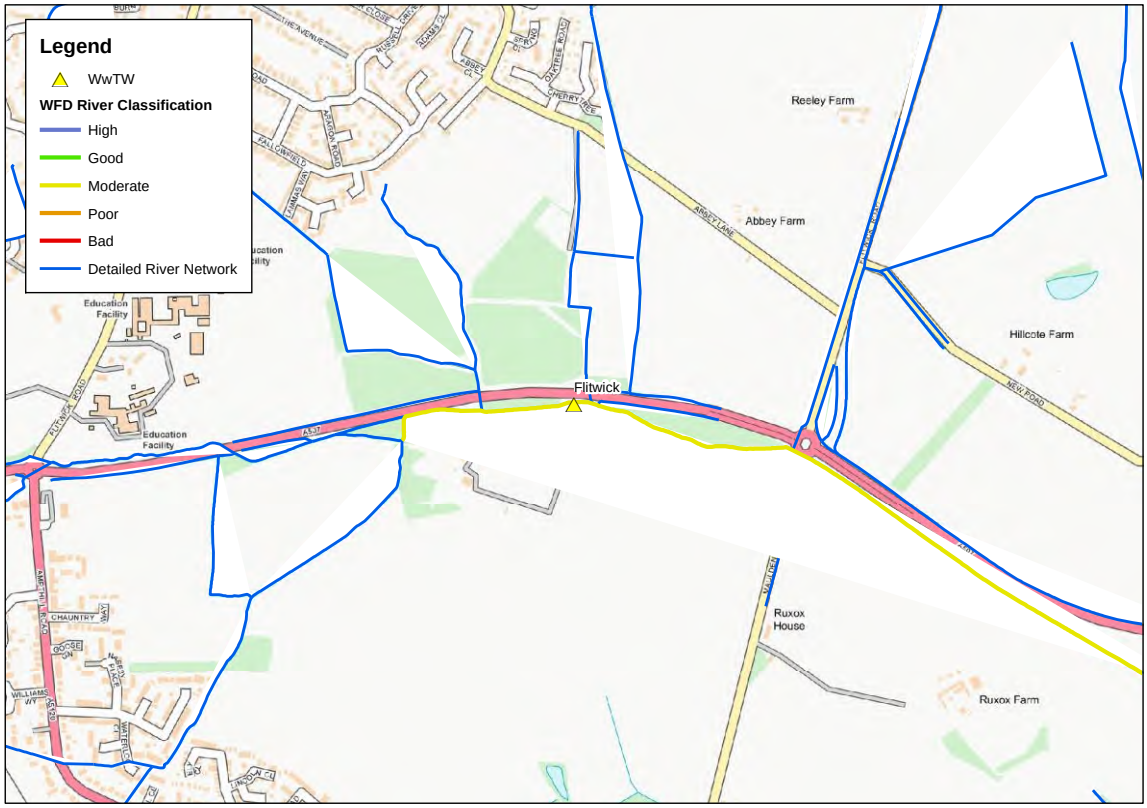


Table 28: Steppingley Brook status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	High	Poor
Objective	Not available	High	High	Good

Table 28 shows the current status of the receiving watercourse including the overall status as well as individual statuses for BOD, NH_4 and P. Flitwick has a moderate overall status, but BOD and NH_4 have a high status and P has a poor WFD status.

Table 29: Consent Values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
8300	3971	15	4.47	5	1.89	2	1.11

Table 29 shows the consented values for Flitwick WwTW. The works has permitted values for 2015 DWF, BOD, NH_4 and P and is currently working within these limits. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 30: Input data and RQP results for Flitwick WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	8.64	Low Flow Softw are	10.38	Based on permitted DWF	
	SD			3.46		
	5%ile	2.16				
BOD (mg/l)	Mean	1.30	Mid Class High	2.23	Observed Data (EA)	3.01
	SD	1.20		1.16		
	Target 90%ile	4.00	2015 WFD			
NH4 (mg/l)	Mean	0.06	Mid Class High	0.69	Observed Data (EA)	0.88
	SD	0.062		0.65		
	Target 90%ile	0.30	2015 WFD			
P (mg/l)	Mean	0.612	Mid Class Poor	1.08	Observed Data (EA)	0.91
	SD	0.612		0.76		
	Target Mean	1.037	2015 WFD			

Table 30 shows the input data and RQP results for Flitwick. The model results indicate that only BOD passes the current WFD target, whereas NH_4 and P fail the targets.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 31 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Modelling at this works indicated that up to three times the current mean effluent flow (the maximum value tested in this study) would be permissible for BOD and NH_4. This is because the watercourse has a very small upstream catchment and therefore its flow and quality downstream of the treatment works is dominated by the effluent discharge. Consequently, discharging large volumes of additional effluent does not significantly detriment the water quality. However, if very large-scale development is proposed at Stage 2, SIMCAT modelling of the downstream reaches should be considered. Phosphorous is the limiting factor here, with an estimated environmental capacity of a maximum of 1,200 additional dwellings permissible, without improving the WwTW.

Table 31: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	27	9	3.29	5480
NH4	14	4.66	0.97	1200
P	27	9	1	5480

A.3.17 Leighton Linslade

Leighton Linslade WwTW discharges into the River Ouzel as shown in Figure 9.

Figure 9: Leighton Linslade WwTW discharge location

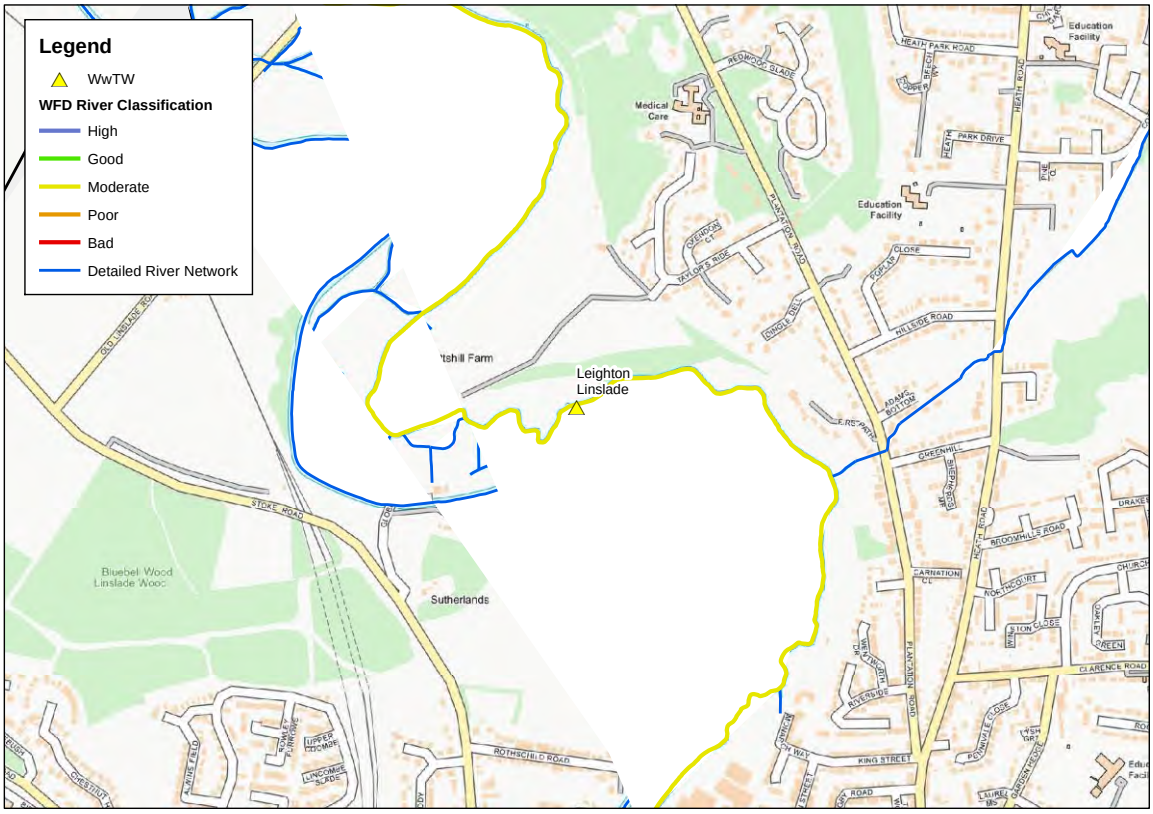


Table 32: River Ouzel status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	Good	Poor
Objective	Not available	High	Good	Good

Table 32 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Leighton Linslade has a moderate overall status, BOD has a high status and NH_4 has a good status. P is the only determinant with a poor WFD status.

Table 33: Consent Values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
7600	5059	60	15.02	30	5.2	2	1.31

Table 33 shows the consented values for Leighton Linslade WwTW. The works has permitted values for 2015 DWF, BOD, NH_4 and P and is currently working within these limits. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 34: Input data and RQP results for Leighton Linslade WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	83.03	Low Flow Software	9.50	Based on permitted DWF	
	SD			3.16		
	5%ile	5.12				
BOD (mg/l)	Mean	2.03	Observed Data	7.57	Observed Data (EA)	5.71
	SD	1.28		3.86		
	Target 90%ile	4.00	2015 WFD			
NH4 (mg/l)	Mean	0.10	Observed Data	2.51	Observed Data (EA)	1.44
	SD	0.120		1.30		
	Target 90%ile	0.60	2015 WFD			
P (mg/l)	Mean	0.24	Observed Data	1.28	Observed Data (EA)	0.49
	SD	0.15		0.66		
	Target Mean	1.029	2015 WFD			

Table 34 shows the input data and RQP results for Leighton Linslade. The model results indicate that none of the pollutants pass the current targets.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 35 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Ammonia is the limiting factor here, with an estimated environmental capacity of a maximum of 760 additional dwellings permissible, without improving the WwTW.

Table 35: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	13.5	4.5	6.26	1320
NH4	11.8	3.93	1.58	760
P	12.8	4.26	0.54	1100

A.3.18 Poppy Hill

Poppy Hill WwTW discharges into the River Ivel watercourse shown in Figure 10.

Figure 10: Poppy Hill WwTW discharge location

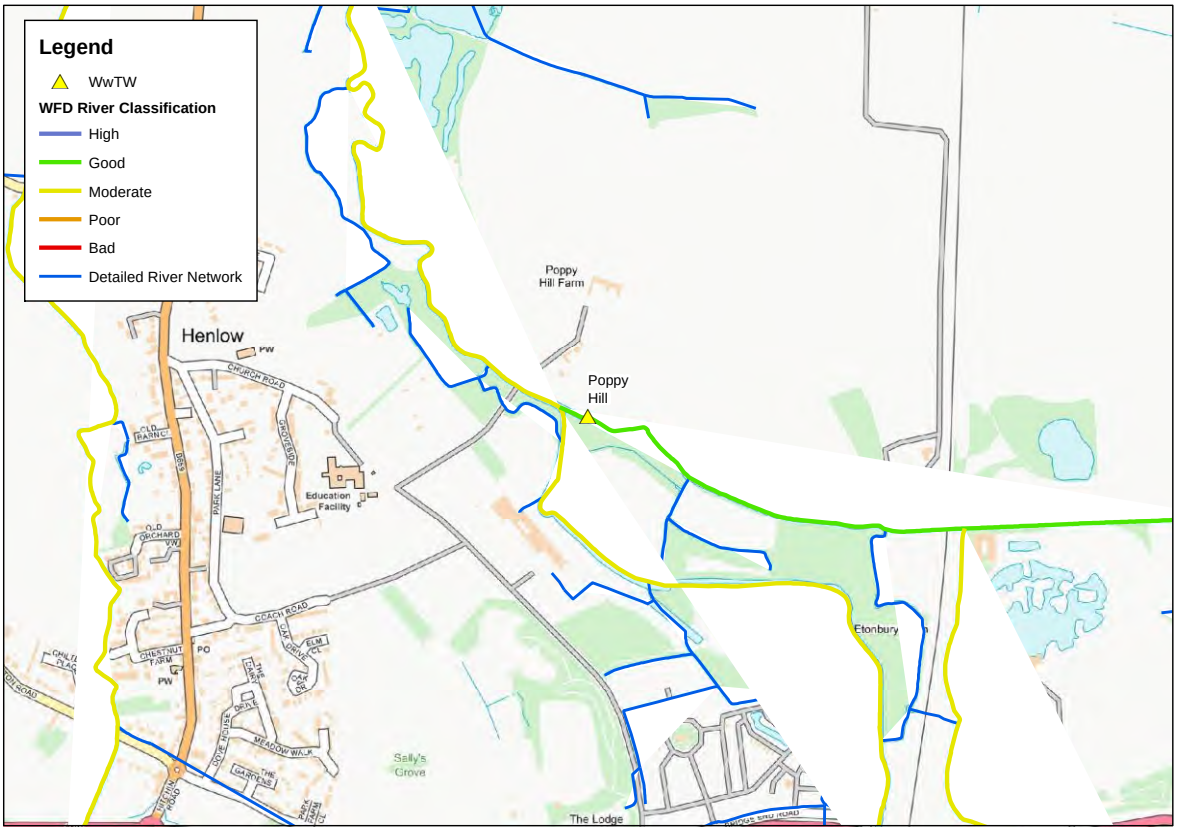


Table 36: River Ivel status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	High	Moderate
Objective	Not available	High	High	Good

Table 36 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Poppy Hill has a moderate overall status, but BOD and NH_4 have a high status and P has a poor WFD status.

Table 37: Consent Values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
4700	4339	20	11.71	8	4.19	2	1.44

Table 37 shows the consented values for Poppy Hill WwTW. The works has permitted values for 2015 DWF, Bod, NH_4 and P and is currently working within these limits. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 38: Input data and RQP results for Poppy Hill WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	99.53	Low Flow Softw are	5.88	Based on permitted DWF	
	SD			1.96		
	5%ile	38.88				
BOD (mg/l)	Mean	1.15	Mid Class High	6.50	Observed Data (EA)	2.36
	SD	0.69		2.72		
	Target 90%ile	4.00				
NH4 (mg/l)	Mean	0.09	Mid Class High	2.13	Observed Data (EA)	0.35
	SD	0.050		1.07		
	Target 90%ile	0.30				
P (mg/l)	Mean	0.15	Mid Class Moderate	1.42	Observed Data (EA)	0.23
	SD	0.15		0.42		
	Target Mean	0.212				

Table 38 shows the input data and RQP results for Poppy Hill. The model results indicate that BOD is the only pollutant that passes the current WFD target, whereas NH_4 and P fail the target.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 39 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Ammonia is the limiting factor here, with an estimated environmental capacity of a maximum of 240 additional dwellings permissible, without improving the WwTW.

Table 39: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	9.4	3.13	2.59	1160
NH4	6.6	2.2	0.38	240
P	6.7	2.23	0.25	270

A.3.19 Potton

Potton WwTW discharges into the Sutton Brook watercourse shown in Figure 11.

Figure 11: Potton WwTW discharge location

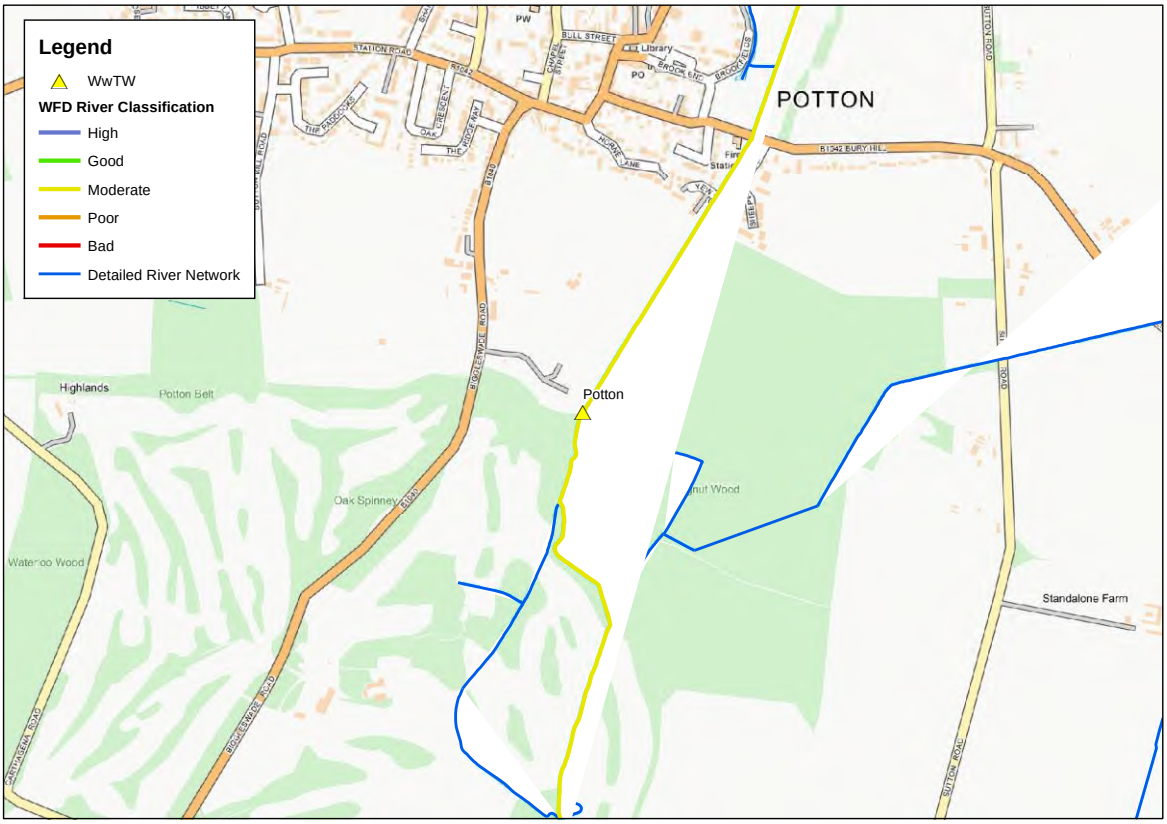


Table 40: Sutton Brook status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	Good	Moderate
Objective	Not available	High	Good	Good

Table 40 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Potton has a moderate overall status, BOD has a high status and NH_4 has a good status.

Table 41: Consent Values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
1200	678	15	4.85	8	6.03	1	0.53

Table 41 shows the consented values for Potton WwTW. The works has permitted values for 2015 DWF, BOD, NH_4 and P and is currently working within these limits. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 42: Input data and RQP results for Potton WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	9.42	Low Flow Software	1.50	Based on permitted DWF	
	SD			0.50		
	5%ile	2.22				
BOD (mg/l)	Mean	1.89	Observed Data	2.71	Observed Data (EA)	3.25
	SD	1.16		1.12		
	Target 90%ile	4.00				
NH4 (mg/l)	Mean	0.21	Observed Data	2.25	Observed Data (EA)	1.13
	SD	0.220		2.02		
	Target 90%ile	0.60				
P (mg/l)	Mean	0.07	Observed Data	0.52	Observed Data (EA)	0.15
	SD	0.04		0.28		
	Target Mean	0.176				

Table 42 shows the input data and RQP results for Potton WwTW. The model results indicate that BOD is the only pollutant that passes the current target, whereas NH_4 and P do not pass the target.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 43 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Ammonia and Phosphorous are the limiting factors here, with an estimated environmental capacity of a maximum of 80 additional dwellings permissible, without improving the WwTW.

Table 43: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	4.5	1.5	3.33	1000
NH4	1.75	0.583	1.24	80
P	1.75	0.583	0.16	80

A.3.20 Sandy

Sandy WwTW discharges into the River Ivel watercourse as shown in Figure 12.

Figure 12: Sandy WwTW discharge location

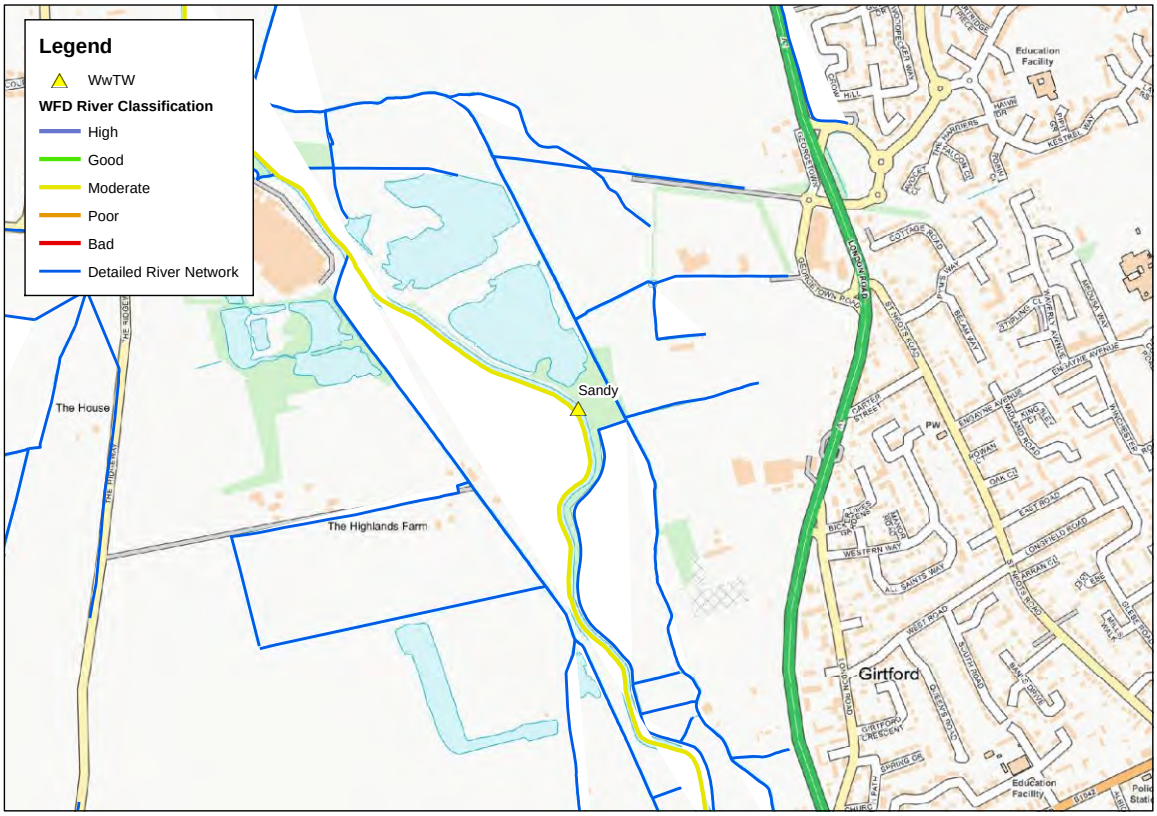


Table 44: River Ivel status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	High	Moderate
Objective	Not available	High	High	Good

Table 44 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Sandy has a moderate overall status, but BOD and NH_4 have a high status and P has a moderate WFD status.

Table 45: Consent Values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
2200	1961	14	24.92	13	8.63	2	1.38

Table 45 shows the consented values for Sandy WwTW. The works has permitted values for 2015 WFD, BOD, NH_4 and P and is currently working within these limits, except for BOD. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 46: Input data and RQP results for Sandy WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	228.10	Low Flow Software	2.75	Based on permitted DWF	
	SD			0.91		
	5%ile	79.66				
BOD (mg/l)	Mean	1.29	Observed Data	12.11	Observed Data (EA)	2.36
	SD	0.75		6.63		
	Target 90%ile	4.00				
NH4 (mg/l)	Mean	0.11	Observed Data	3.41	Observed Data (EA)	0.29
	SD	0.11		2.75		
	Target 90%ile	0.30				
P (mg/l)	Mean	0.19	Observed Data	1.35	Observed Data (EA)	0.21
	SD	0.06		0.59		
	Target Mean	0.212				

Table 46 shows the input data and RQP results for Sandy. The model results indicate that BOD and NH_4 pass the current targets, whereas P fails the WFD target.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 47 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Ammonia is the limiting factor here, with an estimated environmental capacity of a maximum of 340 additional dwellings permissible, without improving the WwTW.

Table 47: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	5.8	1.93	2.59	1000
NH4	3.8	1.26	0.32	340
P	4.8	1.6	0.23	670

A.3.21 Shillington

Shillington WwTW discharges into the Campton Brook watercourse as shown in Figure 13.

Figure 13: Shillington WwTW discharge location

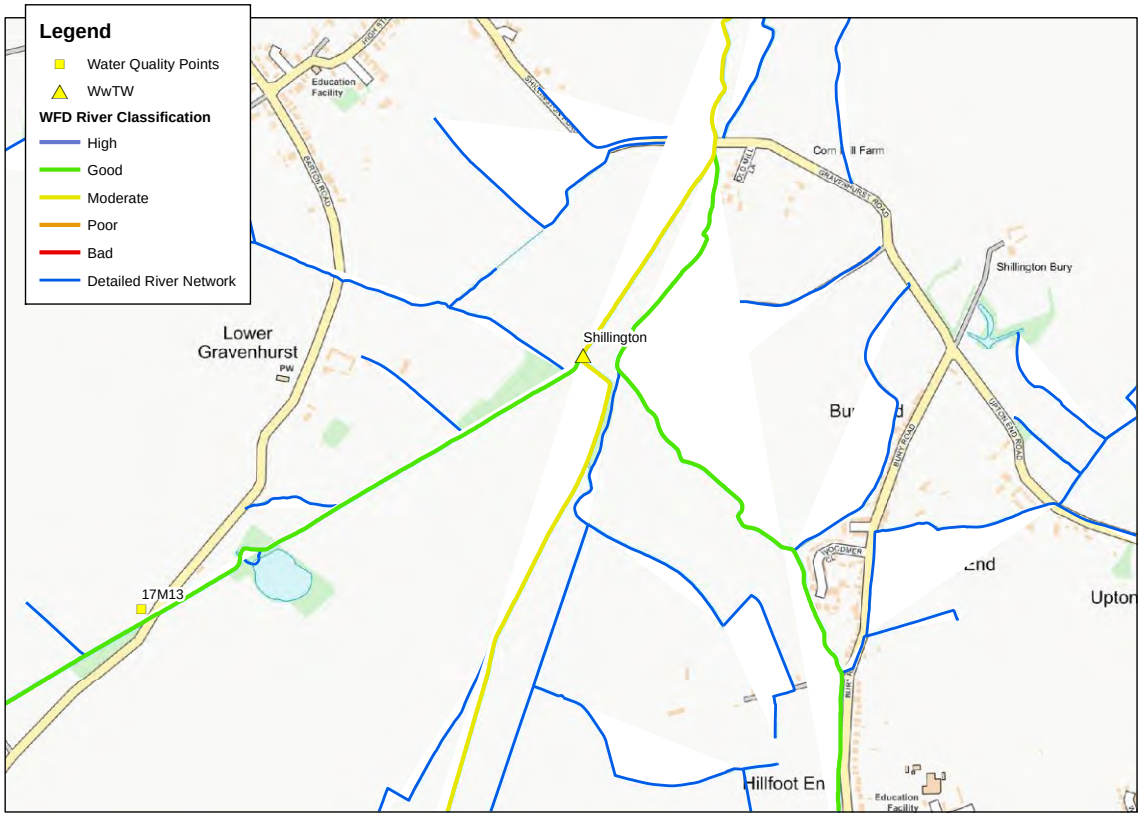


Table 48: Campton Brook status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	High	Moderate
Objective	Not available	High	High	Good

Table 48 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Shillington has a moderate overall status, but BOD and NH_4 have a high status and P has a moderate WFD status.

Table 49: Consent Values for DWF, BOD and NH_4

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
1204	681	40	29.03	15	11.28	Not available	n/a

Table 49 shows the consented values for Shillington WwTW. The works has permitted values for 2015 DWF, BOD and NH_4 and is currently working within these limits. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 50: Input data and RQP results for Shillington WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	8.81	Low Flow Softw are	1.51	Based on permitted DWF	
	SD			0.50		
	5%ile	0.50				
BOD (mg/l)	Mean	1.15	Mid Class High	16.95	Observed Data (EA)	11.75
	SD	0.69		6.35		
	Target 90%ile	4.00				
NH4 (mg/l)	Mean	0.09	Mid Class High	4.69	Observed Data (EA)	3.48
	SD	0.050		3.44		
	Target 90%ile	0.30				
P (mg/l)	Mean	0.640	Mid Class Poor	4.45	Observed Data (EA)	1.85
	SD	0.640		1.87		
	Target Mean	1.077				

Table 50 shows the input data and RQP results for Shillington. The model results indicate that none of the pollutants pass the WFD targets.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 51 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. However, as deterioration of a water body classified as Bad is not permitted, no additional housing can be allocated to Shillington unless there is an upgrade to the treatment works to improve the water body status for BOD, NH_4 and Phosphorous.

Table 51: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	No Deterioration permitted			0
NH4	No Deterioration permitted			0
P	No Deterioration permitted			0

A.3.22 Stanbridgeford

Stanbridgeford WwTW discharges into the Ouzel Brook watercourse shown in Figure 14.

Figure 14: Stanbridgeford WwTW discharge location

Table 52: Ouzel Brook status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	High	High	Poor
Objective	Not available	High	High	Good

Table 52 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Stanbridgeford has a moderate overall status, but BOD and NH_4 have a high status and P has a poor WFD status.

Table 53: Consent Values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
2482	2871	20	4.35	12	1.06	2	0.65

Table 53 shows the consented values for Stanbridgeford WwTW. The works has permitted values for BOD, NH_4 and P and is currently working within these limits. The measured flow is currently above the permitted DWF. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 54: Input data and RQP results for Stanbridgeford WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	9.50	Low Flow Software	3.102	Based on permitted DWF	
	SD			1.034		
	5%ile	0.95				
BOD (mg/l)	Mean	1.47	Observed Data	2.19	Observed Data (EA)	2.70
	SD	0.87		1.12		
	Target 90%ile	4.00				
NH4 (mg/l)	Mean	0.10	Observed Data	0.33	Observed Data (EA)	0.40
	SD	0.13		0.43		
	Target 90%ile	0.30				
P (mg/l)	Mean	0.43	Observed Data	0.63	Observed Data (EA)	0.52
	SD	0.35		0.59		
	Target Mean	1.036				

Table 54 shows the input and RQP results for Stanbridgeford. The model results indicate that BOD is the only pollutant that passes the WFD target.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 55 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Ammonia is the limiting factor here, with an estimated environmental capacity of a maximum of 430 additional dwellings permissible, without improving the WwTW.

Table 55: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	8.05	2.68	2.97	1640
NH4	4.4	1.46	0.44	430
P	8.05	2.68	0.56	1640

A.3.23 Tempsford

Tempsford WwTW discharges into the Stone Brook watercourse as shown in Figure 15.

Figure 15: Tempsford WwTW discharge location

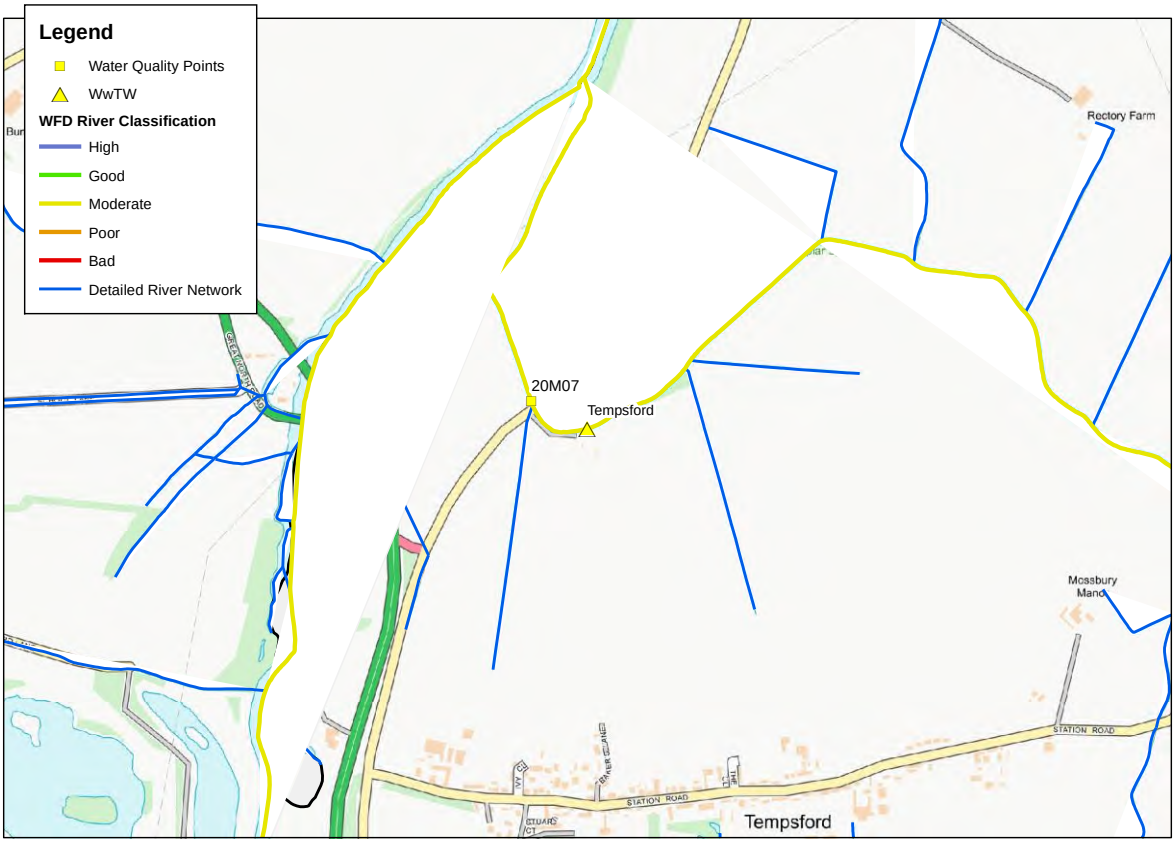


Table 56: Stone Brook status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	Moderate	Good	Moderate
Objective	Not available	Good	Good	Good

Table 56 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for Bod, NH_4 and P. Tempsford has a moderate overall status and BOD and P also have a moderate status. NH_4 is the only pollutant with a good WFD target status.

Table 57: Consent Values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
700	468	20	14.8	3.5	5.08	1	0.45

Table 57 shows the consented values for Tempsford WwTW. The works has permitted values for 2015 DWF, BOD and P and is currently working within these limits. NH_4 is the only pollutant which exceeds its consent value. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 58: Input data and RQP results for Tempsford WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	8.04	Low Flow Softw are	0.875	Based on permitted DWF	
	SD			0.290		
	5%ile	1.09				
BOD (mg/l)	Mean	5.75	Mid Class Moderate	5.66	Observed Data (EA)	11.06
	SD	5.75		4.85		
	Target 90%ile	6.50				
NH4 (mg/l)	Mean	1.80	Mid Class Poor	1.95	Observed Data (EA)	3.53
	SD	1.80		1.66		
	Target 90%ile	2.50				
P (mg/l)	Mean	0.15	Mid Class Moderate	0.44	Observed Data (EA)	0.2
	SD	0.15		0.19		
	Target Mean	0.211				

Table 58 shows the inputs and RQP results for Tempsford. The model results indicate that none of the pollutants can pass the current targets.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 59 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. However, as deterioration of a water body classified as Bad is not permitted, no additional housing can be allocated to Tempsford unless there is an upgrade to the treatment works to improve the water body status for Phosphorous.

Table 59: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	No Deterioration permitted			0
NH4	2.625	0.875	3.4	580
P	1.5	0.2	0.22	200

A.4 Results for Thames Water WwTWs

A.4.1 Markyate

Markyate WwTW discharges into the River Ver watercourse as shown in Figure 16.

Figure 16: Markyate WwTW discharge location

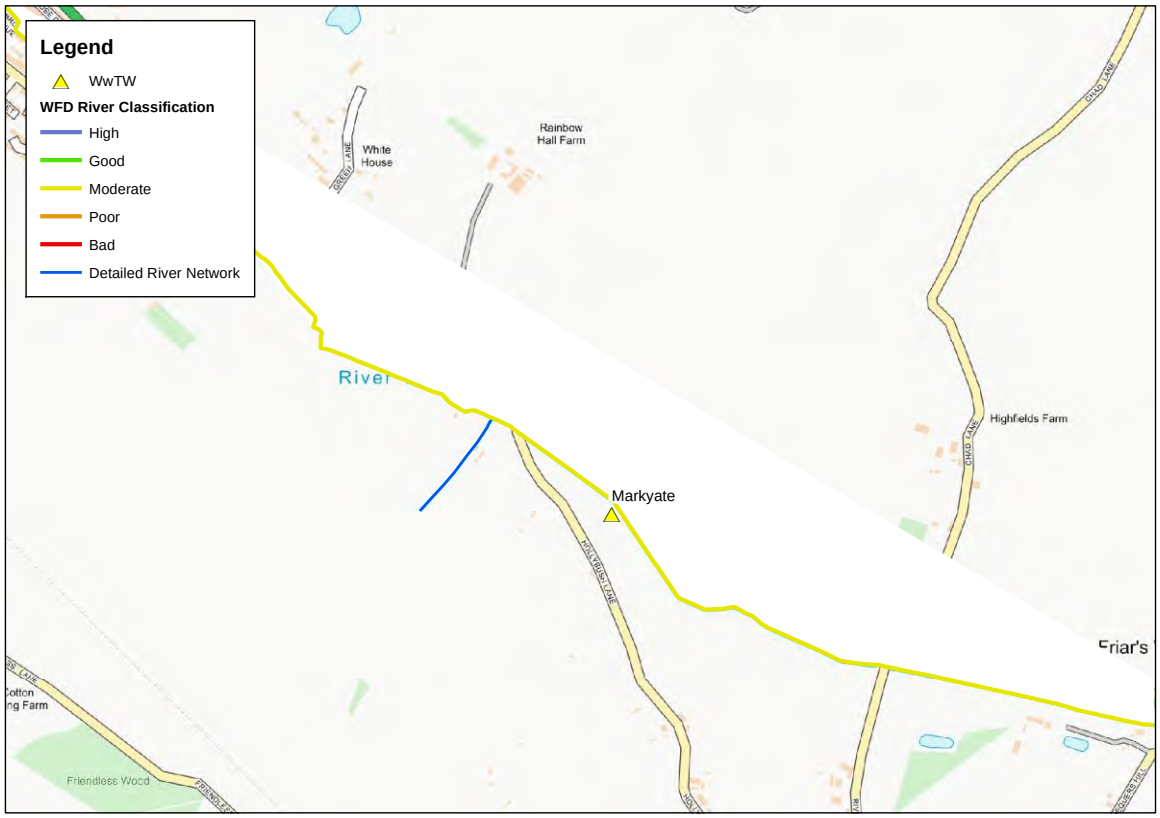


Table 60: River Ver status and objectives

	Overall	BOD	Ammonia	Phosphorus
2015 status	Moderate	Good	Good	Good
Objective	Good by 2027	High by 2027	High by 2027	High by 2027

Table 60 shows the current status of the receiving watercourse including the overall status as well as the individual statuses for BOD, NH_4 and P. Markyate has a moderate overall status and all the pollutants have a good WFD status.

Table 61: Consent values for DWF, BOD, NH_4 and P

DWF (m3/d)		BOD (mg/l)		NH4 (mg/l)		P (mg/l)	
Permitted DWF	Measured Q90	95%ile consent value	Modelled 95%ile	95%ile consent value	Modelled 95%ile	Mean consent value	Modelled mean
N/A	Not available to calculate	20	7.1	Not available	N/A	Not available	N/A

Table 61 shows the consented values for Markyate. The works has permitted values for BOD only as data for the other pollutants was not available. BOD is currently working within its consented value. It has been assumed that, as effluent volumes increase due to growth, the treatment works would continue to discharge at its present-day effluent quality.

Table 62: Input data and RQP results for Markyate WwTW

Parameter	Statistic	River	Source	Present Day		
				WRC	Source	RQP Result
Flow (Ml/d)	Mean	0.17	Low Flow Software	1.030	Observed Data	
	SD			0.257		
	5%ile	0.04				
BOD (mg/l)	Mean	4.50	Mid Class Good	3.950	Observed Data (EA)	6.20
	SD	4.50		1.646		
	Target 90%ile	5.00	2015 WFD			
NH4 (mg/l)	Mean	0.450	Mid Class Good	0.527	Observed Data (EA)	1.14
	SD	0.450		1.034		
	Target 90%ile	0.60	2015 WFD			
P (mg/l)	Mean	0.05	Observed Data	3.168	Observed Data (EA)	2.82
	SD	0.05		1.389		
	Target Mean	0.077	2015 WFD			

Table 62 shows the inputs and RQP results for Markyate. The model results indicate that none of the pollutants can pass the current targets.

Future flows have been estimated for each pollutant to determine the maximum number of houses that the WwTW can accommodate without class deterioration or more than 10% deterioration. Table 63 shows the future maximum additional effluent flows, and equivalent number of new dwellings which could be accommodated without causing deterioration or requiring a treatment works upgrade. Note that at this works, modelling indicated that up to three times the current mean effluent flow (the maximum value tested in this study) would be permissible. This is because the watercourse has a very small upstream catchment and therefore its flow and quality downstream of the treatment works is dominated by the effluent discharge. Consequently, discharging large volumes of additional effluent does not significantly detriment the water quality. If very large-scale development is proposed at stage 2, SIMCAT modelling of the downstream reaches should be considered.

However, as deterioration of a water body classified as Bad is not permitted, no additional housing can be allocated to Markyate unless there is an upgrade to the treatment works to improve the water body status for Phosphorous.

Table 63: Number of houses permitted and future flow statistics

Pollutant	Future Flow Mean	Future Flow SD	RQP Result	No of Houses
BOD	3.09	1.03	4.18	720
NH4	3.09	1.03	1.24	720
P	No Deterioration permitted			0

A.5 Summary and Conclusion

A.5.2 Method

The increased discharge of effluent due to a growth in population served by a Wastewater Treatment Works (WwTW) may impact the quality of the receiving water. The Water Framework Directive (WFD) does not allow a watercourse to deteriorate from its current class (either water body or element class).

It is Environment Agency (EA) policy to model the impact of increasing effluent volumes on the receiving watercourse. Where the scale of development is such that a deterioration is predicted, a new Environmental Permit (EP) may be required for the WRC to improve the quality of the final effluent, so that the extra pollution load will not result in a deterioration in the water quality of the watercourse. This is known as a "no deterioration" or "load standstill".

As Central Bedfordshire Council has not provided growth numbers or locations at this stage, each WwTW was investigated to determine how many houses can be built with the current technology without more than 10% deterioration or class deterioration. There were 17 Wastewater Treatment Works (WwTWs) that were identified, however two of these discharge to groundwater and were not assessed. The EA has reviewed the list of WwTWs and has suggested that a water quality assessment should be undertaken on fifteen of these.

A.5.3 Results

Table 64 summarises the modelling results of the maximum potential dwellings that could be placed in each sewer treatment catchment.

Table 64: Potential Housing Summary and future WwTW flow statistics

WRC	Future Flow Mean	Future Flow SD	No of Houses
Barton Le Clay	Upgrade Treatment Works		0
Biggleswade	7	2.33	620
Chalton	Upgrade Treatment Works		0
Clifton	8.2	2.73	1500
Clophill	2.7	0.9	150
Dunstable	Upgrade Treatment Works		0
Flitwick	14	4.66	1200
Leighton Linslade	11.8	3.93	760
Poppy Hill	6.6	2.2	240
Potton	1.75	0.583	80
Sandy	3.8	1.26	340
Shillington	Upgrade Treatment Works		0
Stanbridgeford	4.4	1.46	430
Tempsford	Upgrade Treatment Works		0
Markyate	Upgrade Treatment Works		0

A.5.4 Conclusions

The following conclusions are drawn from this stage 1 water quality impact assessment:

- Barton Le Clay, Chalton, Dunstable, Markyate, Shillington, and Tempsford WwTWs need to be upgraded to accommodate housing growth without causing deterioration of the "Bad" WFD class. It is therefore anticipated that all growth in these catchments would need to be phased to enable time for upgrades to be implemented.
- All of the remaining WwTWs have some capacity within their existing quality permits to accommodate future development without causing a class deterioration or more than 10% deterioration.
- In some settlements the available capacity is quite small, reflecting the limited dilution potential available in the receiving watercourse.
- In other settlements the WwTW allows for a large future effluent discharge which does not affect the water quality downstream due to large volumes of discharge. However, if large scale developments are proposed at these locations additional SIMCAT modelling should be considered to test for deterioration downstream as a result of growth at several treatment works discharging to the same river system.
- Where development in excess of the equivalent number of dwellings indicated is allocated, it is probable that a WwTW upgrade would be required in order to meet a tighter permit condition set to ensure that load-standstill is met.
- This stage 1 assessment has not considered the potential for growth to prevent watercourses from meeting WFD Good Ecological Status.
- The assessment is provided to indicate what environmental headroom for growth is available without the need to upgrade treatment works or make other interventions. It is not intended as an absolute constraint to growth.

Further analysis will be undertaken in the stage 2 assessment when development numbers are provided from Central Bedfordshire Council.

Annex I: Environment Agency Input Data

The following spreadsheets were provided by the Environment Agency's Anglian region for 14 treatment works.

Central Beds WCS Assessment Datasheet April 2016

Catchment	**Barton Le Clay STW**
STW Point Code	**BARTON**
Date	
Receiving Water	Barton Brook leading to Campton Brook
WFD Waterbody ID	GB105033037500 - Barton Brook
Upstream Sample Point	None
Downstream Sample Point	17M05 - BARTON BK.ION BRIDGE HANSCOMBE END

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**1143**	-	AWCNF/11060
Post-Growth DWF	m3/day			
BOD	mg/l	**15**	95 %ile	
Ammonia	mg/l	**6**	95 %ile	
Phosphate	mg/l	**-**	AA	

Upstream River data

Variable	Unit	Mean	SD	Comments/Assumptions
Flow	m3/day	**2748**	**959**	from Low Flows Enterprise (H&T, May 2010)
BOD	mg/l	**1.15**	**0.69**	Assume u/s river quality mid-high status
Ammonia	mg/l	**0.09**	**0.05**	Assume u/s river quality mid-high status
Phosphate	mg/l	**0.022**	**0.022**	Assume u/s river quality mid-high status as ILC model predicts >90% of P from STW. No other obvious sources u/s.

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**1429**	**476**	Based on current permitted DWF of 1143 m3/day
Post-Growth flow	m3/day			
BOD	mg/l	**2.66**	**1.78**	No step change. 24.01.2000 to 12.01.2016
Ammonia	mg/l	**1.23**	**1.197**	24/05/2011 to 28/02/2016
Phosphate	mg/l	**5.21**	**1.2**	Since last step change (All pre-OSM data). 28/11/03 to 19/11/07

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **N**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	High	**4.00**	**-**
Ammonia	High	**0.60**	**-**
Phosphate	Poor	**-**	**1.058**

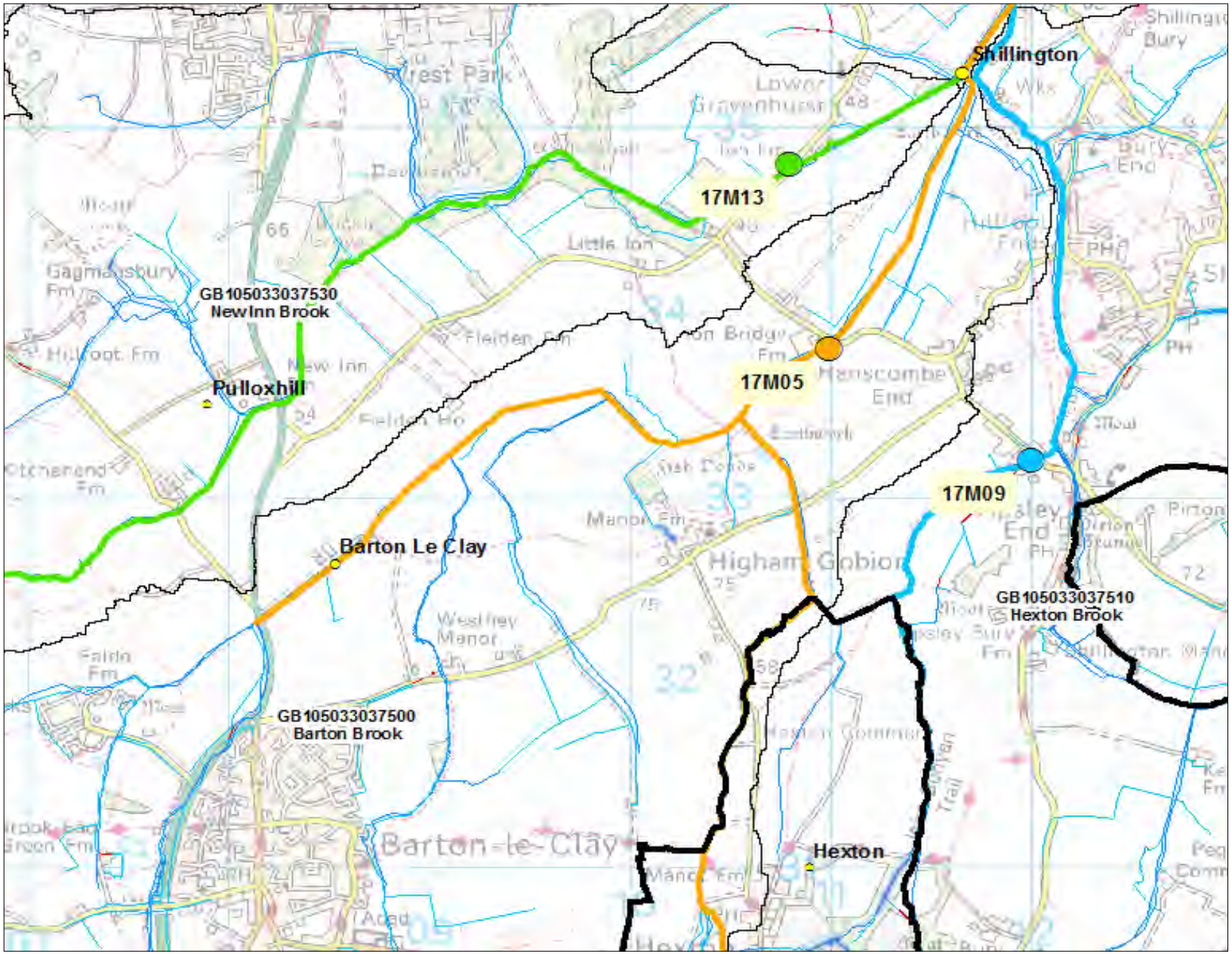
2. Improve WFD Status

Variable	Status	90 %ile (mg/l)	AA (mg/l)
Phosphate	Good	**-**	**0.197**
Phosphate	Moderate	**-**	**0.081**

Comments/Assumptions

No Deterioration assessments
RBMP2 status (based on 2012-2014 data at sample point 17M05):
BOD - High
Ammonia - High
Phosphate - Poor
- calculate permit limits required to maintain RBMP2 status

Improve WFD Status assessments
- applies to phosphate element only
- calculate permit limit required to achieve Good and Moderate status


Shillington
17M13
GB105033037530
NewInn Brook
Pulloxhill
17M05
17M09
Barton Le Clay
GB105033037510
Hexton Brook
GB105033037500
Barton Brook
Hexton

Central Beds WCS Assessment Datasheet April 2016

Catchment	**Biggleswade STW**
STW Point Code	BIGGLES
Date	
Receiving Water	River Ivel
WFD Waterbody ID	GB105033038170 - Ivel (Langford to Roxton)
Upstream Sample Point	19M01 - R.IVEL BROOM MILL
Downstream Sample Point	19M04 - R.IVEL NEW ROAD BEESTON

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**4100**	-	AW1NF/1162
Post Growth DWF	m3/day		-	
BOD	mg/l	**25**	95 %ile	
Ammonia	mg/l	**10**	95 %ile	
Phosphate	mg/l	**2**	AA	*UWWTD SA(E) requirement, effective 01/01/2005*

Upstream River data

Variable	Unit	Mean	SD	Comments/Assumptions
Flow	m3/day	**194314**	**67219**	Low Flows Enterprise, H&T, March 2013
BOD	mg/l	**1.28**	**0.67**	since last step change 05.08.04 to 01.05.14
Ammonia	mg/l	**0.11**	**0.08**	since last step change 09.03.07 to 01.05.14
Phosphate	mg/l	**0.21**	**0.06**	since last step change 12.12.07 to 01.05.14

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**5125**	**1708**	Based on post-'flow' scheme DWF
Post Growth flow	m3/day			
BOD	mg/l	**5.34**	**2.77**	since last step change 03.05.07 to 18.03.16
Ammonia	mg/l	**1.29**	**0.95**	since last step change 27.11.08 to 17.03.16
Phosphate	mg/l	**1.04**	**0.38**	Since last step change. 07.02.08 to 18.03.16

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **N**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	High	**4.00**	**-**
Ammonia	High	**0.30**	**-**
Phosphate	Moderate	**-**	**0.21**

2. Improve WFD Status

Variable	Status	90 %ile (mg/l)	AA (mg/l)
Phosphate	Good	**-**	**0.088**

Comments/Assumptions

No Deterioration assessments
RBMP2 status (based on 2012-2014 data at sample point 19M04):
BOD - High
Ammonia - High
Phosphate - Moderate
- calculate permit limits required to maintain 'RBMP2 status'

Improve WFD Status assessments
- applies to phosphate element only
- assume mid-Good quality upstream (mean & sd 0.068 mg/l)
- calculate permit limit required to achieve Good status

Central Beds WCS Assessment - Permit limits required

NO DETERIORATION ASSESSMENT

	Biggleswade STW		
	BOD	Ammonia	Phosphate
River Downstream of Discharge			
No Deterioration target	High	High	Moderate
Designated Salmonid Fishery ?	N	-	-
River quality target (90-percentile or AA)	4.00	0.30	0.21
Current Consent			
Current Permited DWF (m3/day)	4100		
Consent limits (95%ile or AA)	25	10	2
Discharge Quality Required - Current Permitted			
Current Permited DWF (m3/day)	4100		
Effluent quality required (95%ile or AA)			
Discharge Quality Required - Post Growth			
Post Growth DWF (m3/day)	0		
Effluent quality required (95%ile or AA)			

IMPROVEMENT TO WFD STATUS ASSESSMENT

	Biggleswade STW		
		Phosphate	
River Downstream of Discharge			
WFD Status target		Good	
Designated Salmonid Fishery ?		-	
River quality target (90-percentile or AA)		0.088	
Discharge Quality Required - Current Permitted DWF			
Current DWF (m3/day)	4100		
Effluent quality required (95%ile or AA)			
Discharge Quality Required - Post Growth			
Pre-AMP5 DWF (m3/day)	0		
Effluent quality required (95%ile or AA)			

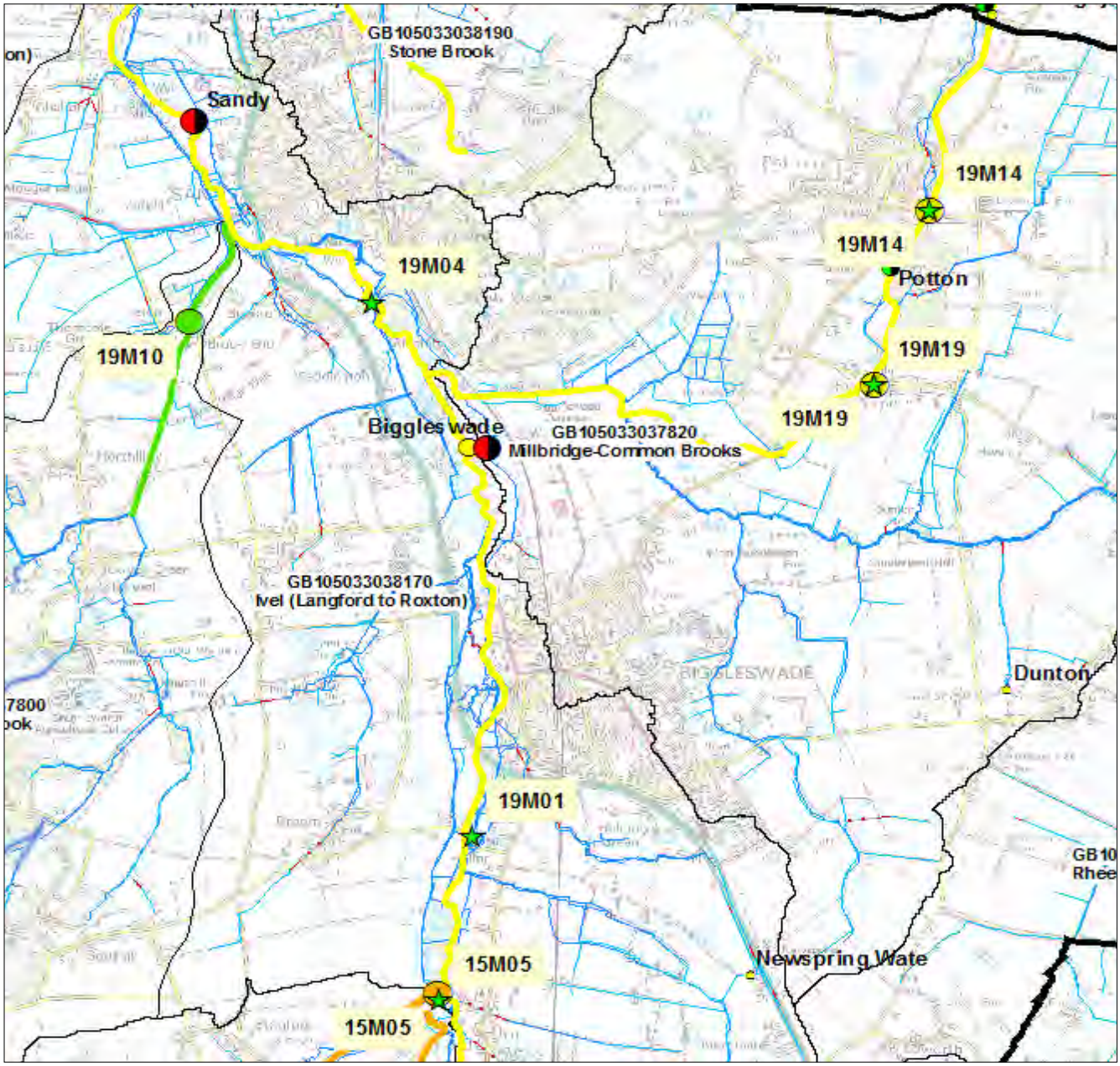
Key to 'Effluent Quality Required'

Green – no change to current consent required

Amber – consent tightening required, but within limits of conventional treatment processes

Red Value – not achievable within limits of conventional treatment processes

WCS Conclusion:


GB105033038190
Stone Brook
Sandy
19M14
19M14
19M04
Potton
19M10
19M19
19M19
Biggleswade
GB105033037820
Millbridge-Common Brooks
GB105033038170
Ivel (Langford to Roxton)
Dunton
19M01
15M05
Newspring Wate
15M05

Monte Carlo Datasheet - for Central Beds WCS, April 2016

Catchment	**Chalton STW**
STW Point Code	**CHALTON**
Date	
Receiving Water	River Flit
WFD Waterbody ID	GB105033037640
Upstream Sample Point	16M05 - monitoring ceased in 2008
Downstream Sample Point	16M06 - FANCOTT BK.TRIB.IVEL CRANFORD BRIDGE

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**15000**	-	AW1NF/876
Post Growth DWF	m3/day			Incorporating all proposed growth & development in Local Plans
BOD	mg/l	**12**	95 %ile	
Ammonia	mg/l	**1**	95 %ile	Limit applies from 1st April 2018 (AMP6 scheme)
Phosphate	mg/l	**2**	AA	UWWTD SA(E) requirement since 1999

Upstream River data

Variable	Unit	Mean	SD	Comments/Assumptions
Flow	m3/day	**1037**	**432**	from Low Flows Enterprise, October 2012
BOD	mg/l	**0.86**	**0.53**	Since last step change. 25.11.04 to 25.03.08 [sample point not monitored since 2008]
Ammonia	mg/l	**0.04**	**0.04**	No step changes. 24.01.00 to 25.03.08 [sample point not monitored since 2008]
Phosphate	mg/l	**0.058**	**0.058**	Assume mid-Good quality (for sample point 16M06)

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**18750**	**6250**	Based on current permitted DWF of 15000 m3/day
Post Growth DWF	m3/day			
BOD	mg/l	**3.22**	**1.21**	Since last step change. 01.02.10 to 28.02.16
Ammonia	mg/l	**1.78**	**0.98**	Since last step change. 21.10.10 to 28.02.16
Phosphate	mg/l	**0.92**	**0.37**	Since last step change 03.12.07 to 02.02.16

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **N**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	High	**4.00**	-
Ammonia	High	**0.30**	-
Phosphate	Poor	-	**1.03**

2. Improve WFD Status

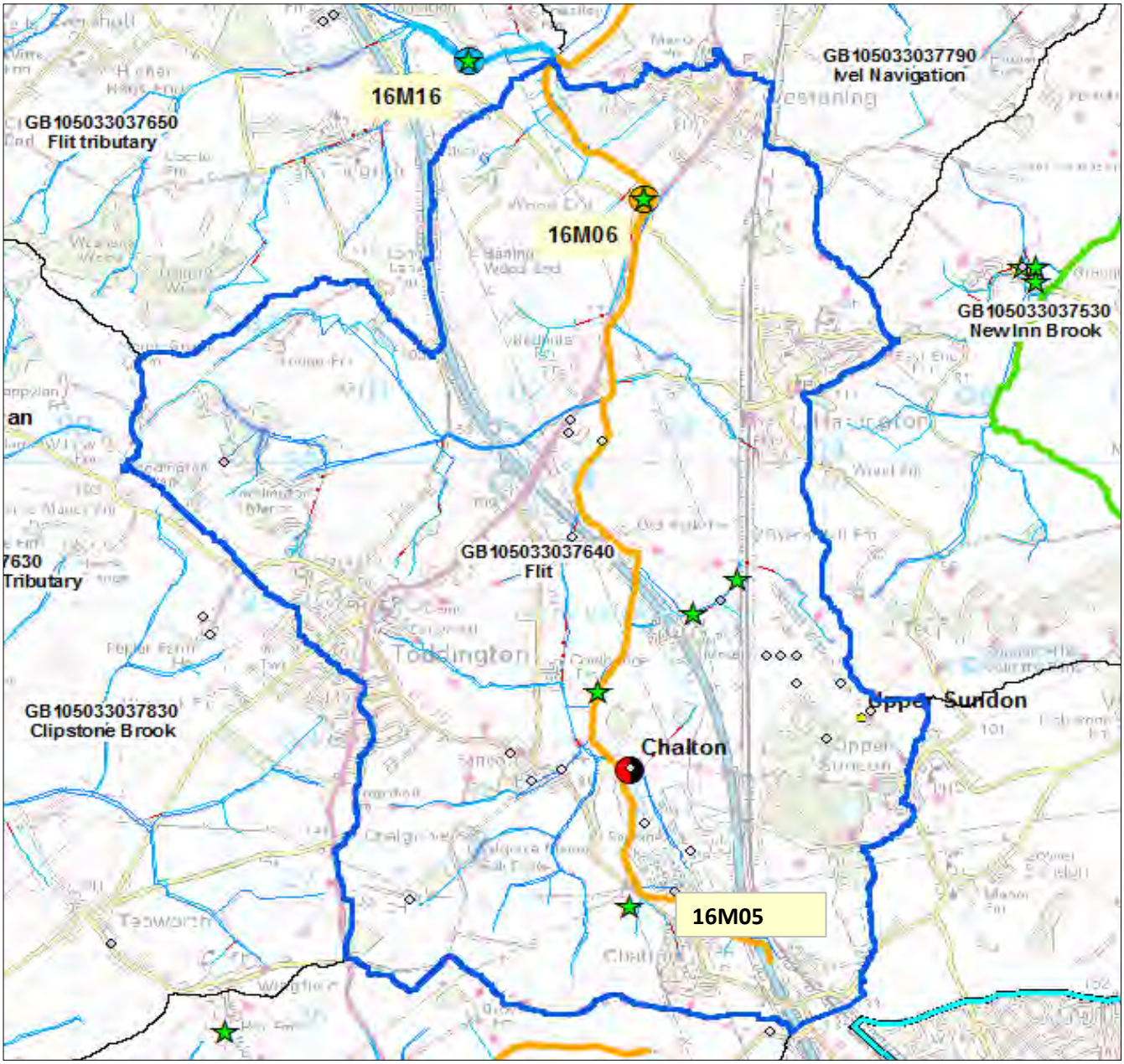
Variable	Status	(mg/l)	(mg/l)
Phosphate	Good	-	**0.075**
Phosphate	Moderate	-	**0.184**

Comments/Assumptions

No Deterioration assessments
RBMP2 status (based on 2012-2014 data at sample point 16M06):
BOD - High
Ammonia - High
Phosphate - Poor
- calculate permit limits required to maintain RBMP2 status at current permitted DWF and at '2031 DWF' incorporating proposed growth & development
(N.B. AMP6 WFD No Deterioration permit limit of 1 mg/l is now confirmed. The new permit will be effective from 1st April 2018)

Improve WFD Status assessments
- applies to phosphate element only
- calculate permit limit required to achieve Good status and Moderate status for current and 2031 DWF scenarios

N.B. Chalton STW is also identified as a receptor for additional foul flows from Luton. Assessment needs to consider the cumulative discharge rate.


GB105033037790
Ivel Navigation
16M16
GB105033037650
Flit tributary
16M06
GB105033037530
New Inn Brook
GB105033037640
Flit
Toddington
Upper Sundon
GB105033037830
Clipstone Brook
Chalton
16M05

Monte Carlo Datasheet - for Central Beds WCS, April 2016

STW	**Clifton STW**
Point Code	Clifton
Date	
Receiving Water	Henlow Brook
WFD Waterbody ID	GB105033037770 - Henlow Brook
Upstream Sample Point	15M03 - HENLOW BK.TRIB.IVEL HENLOW CROSS
Downstream Sample Point	15M05 - HENLOW BK.TRIB.IVEL D/S LANGFORD MILL

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**2931**	-	**AW1NF944**
Post Growth DWF	m3/day			
BOD	mg/l	**14**	95 %ile	
Ammonia	mg/l	**5**	95 %ile	
Phosphate	mg/l	**1**	AA	AMP4 HD scheme, effective 01/04/10

Upstream River data

Variable	Unit	Mean	SD/Q95	Comments/Assumptions
Flow	m3/day	**4840**	**690**	Flow data from file - no attribution.
BOD	mg/l	**1.14**	**1.09**	Since last step change, single outier removed. 21/09/04 to 05/12/07
Ammonia	mg/l	**0.2**	**0.44**	No step changes. Date range 19/01/00 to 07/04/16
Phosphate	mg/l	**0.069**	**0.069**	Upstream status Poor due to MoD discharge. Assume mid-Good for WCS calculations.

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Consented Flow	m3/day	**3664**	**1221**	Based on current consented DWF of 2931 m3/day
Post Growth DWF	m3/day			
BOD	mg/l	**1.84**	**1.83**	19/05/10 to 24/03/16 (i.e. since last step change)
Ammonia	mg/l	**0.17**	**0.5**	03/05/08 to 23/03/16 (i.e. since last step change)
Phosphate	mg/l	**0.4**	**0.43**	09/04/09 to 24/03/16 (i.e. since last step change)

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **N**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	High	**4.00**	**-**
Ammonia	High	**0.30**	**-**
Phosphate	Poor	**-**	**1.091**

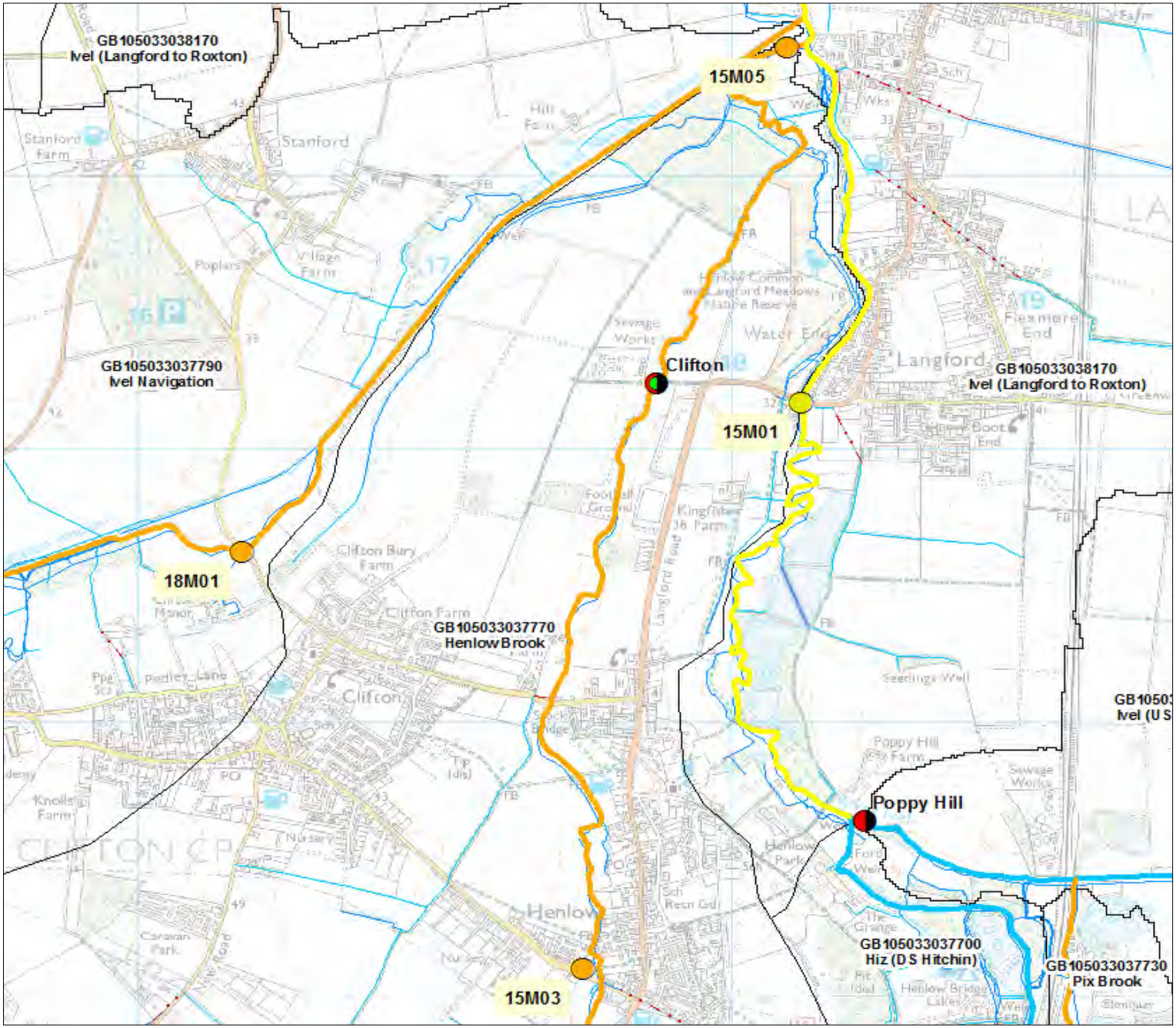
2. Improve to Good Status

Variable	Status	90 %ile (mg/l)	AA (mg/l)
Phosphate	Good	**-**	**0.089**
Phosphate	Moderate	**-**	**0.212**

Comments/Assumptions

No Deterioration
RBMP2 status (based on 2012-2014 data at sample point 15M05):
BOD - High
Ammonia - High
Phosphate - Poor

Improve to Good Status
- Applies to phosphate element only
- calculate permit limits required to achieve Moderate and Good status
(assume the upstream RAF discharge has been 'sorted', and use mid-Good upstream quality: mean and sd 0.069 mg/l)


GB105033038170
Ivel (Langford to Roxton)
15M05
GB105033037790
Ivel Navigation
Clifton
GB105033038170
Ivel (Langford to Roxton)
15M01
18M01
GB105033037770
Henlow Brook
Poppy Hill
GB105033037700
Hiz (D S Hitchin)
GB105033037730
Pix Brook
15M03

WFD Assessment Datasheet - Central Beds WCS 2016

Catchment	**Clophill STW**
STW Point Code	CLOPHIL
Date (& Officer)	10/10/2016 (SH)
Receiving Water	River Flit
WFD Waterbody ID	GB105033037790 - Flit and Ivel Navigation d/s of Shefford
Upstream Sample Point	No appropriate u/s sample point
Downstream Sample Point	16M03 - R.FLIT BEADLOW RD.BR.

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**1800**	-	AW1NF127
BOD	mg/l	**45**	95 %ile	
Ammonia	mg/l	**15**	95 %ile	
Phosphate	mg/l	**-**	AA	*(Proposed AMP5 WFD scheme was 'technically infeasible')*

Upstream River data

Variable	Unit	Mean	SD/Q95	Comments/Assumptions
Flow	m3/day	46200	19200	*From old calculations - origin uncertain*
BOD	mg/l	**1.15**	**0.69**	No data - assume mid-High status
Ammonia	mg/l	**0.26**	**0.15**	No data - assume mid-Good status
Phosphate	mg/l	**0.612**	**0.612**	No data - assume mid-Poor status

STW - current discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**2250**	**750**	Standard assumptions: Mean = 1.25 x DWF, sd= mean / 3
Current Flow	m3/day	**1417**	**260**	2015 Flow compliance data. ****Please check with AWS****
BOD	mg/l	**15.63**	**7.73**	Data since latest setp change. 04/03/2010 to 22/08/2016
Ammonia	mg/l	**4.66**	**3.76**	Data since latest setp change. 30/01/2008 to 22/08/2016
Phosphate	mg/l	**7.09**	**1.09**	Since last step change. 30/10/00 to 06/05/08 (No OSM data)

Downstream WFD Targets

Salmonid Fishery (Y/N) ?	**N**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	High	**4.00**	**-**
Ammonia	Good	**0.60**	**-**
Phosphate	Poor	**-**	**1.036**

2. Improve WFD Status

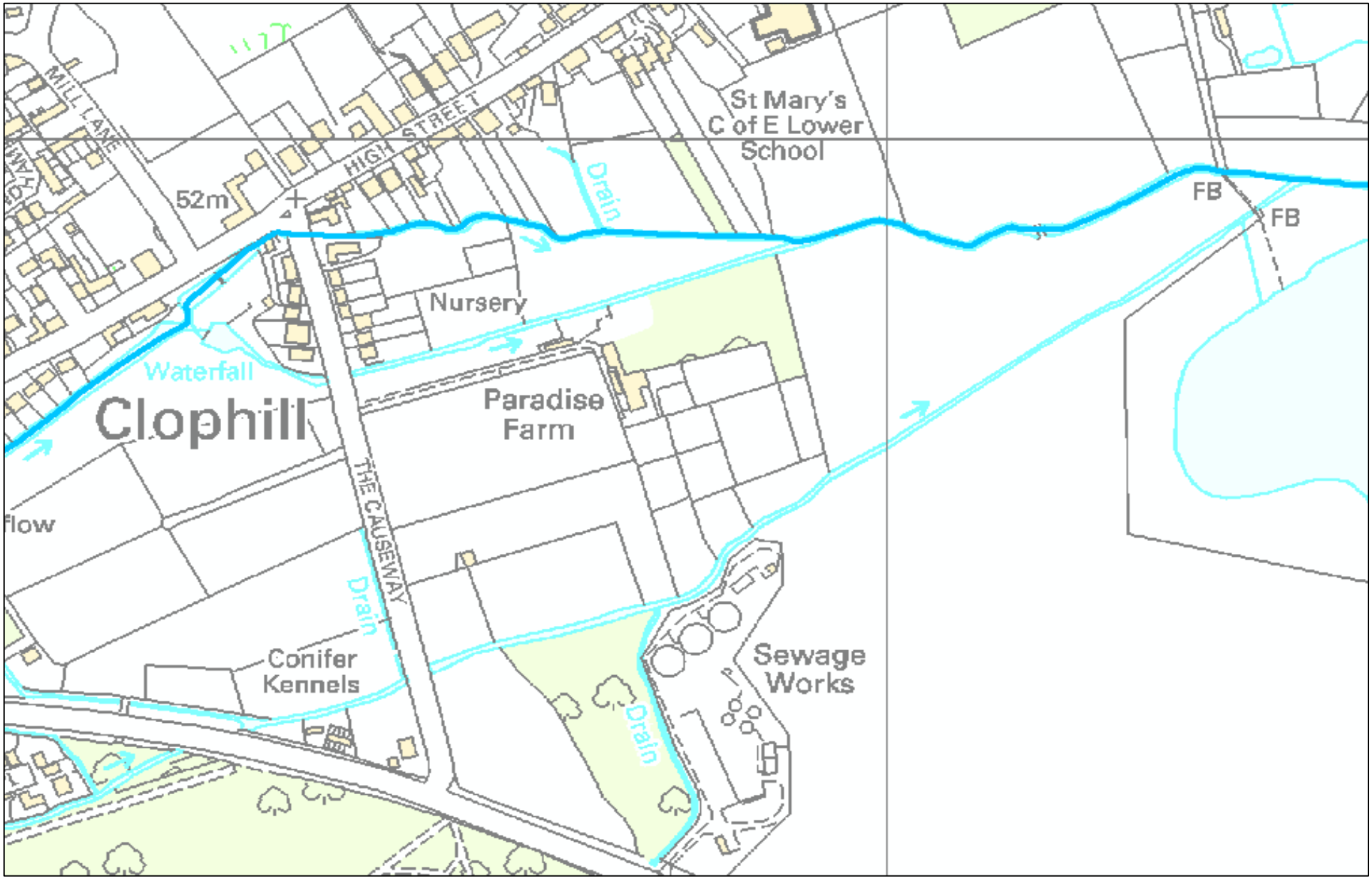
Variable	Status	90 %ile (mg/l)	AA (mg/l)
Phosphate	Good	**-**	**0.076**
Phosphate	Moderate	**-**	**0.187**

Comments/Assumptions

No Deterioration assessments
RBMP2 status (based on 2012-2014 data at sample point 16M03):
BOD - High *(carried over from RBMP1)*
Ammonia - Good
Phosphate - Poor
- calculate permit limits required to maintain RBMP2 status

Improve WFD Status assessments
- applies to phosphate element only
- **assume mid-Good status upstream (mean and sd 0.059 mg/l)**
- calculate permit limits required to achieve Good and Moderate status


16M03
R.FLIT BEADLOW RD.BR.
Clophill STW
16M15
RUNNING WATERS A507 HOLLINGTON JUNCTION


MILL LANE
HIGH STREET
52m
St Mary's
C of E Lower
School
Drain
FB
FB
Nursery
Waterfall
Clophill
Paradise
Farm
THE CAUSEWAY
flow
Drain
Conifer
Kennels
Drain
Sewage
Works

Monte Carlo Datasheet - for Central Beds WCS, April 2016

Catchment	**Dunstable STW**
Date	
Receiving Water	Ouzel Brook
WFD Waterbody ID	GB105033030530 - Ouzel Brook
Upstream Sample Point	06M30 (monitoring ceased in 2003)
Downstream Sample Point	06M03 - OUZEL BK.TRIB.OUZEL STANBRIDGEFORD

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**17000**	-	AWCNF/10397
Post Growth DWF	m3/day			Incorporating all proposed growth & development in Local Plans
BOD	mg/l	**12**	95 %ile	
Ammonia	mg/l	**3**	95 %ile	Limit applies from 1st April 2018 (AMP6 scheme)
Phosphate	mg/l	**2**	AA	UWWTD SA(E) requirement since 2003

Upstream River data

Variable	Unit	Mean	SD	Comments/Assumptions
Flow	m3/day	**2765**	**950**	from Low Flows Enterprise, October 2012
BOD	mg/l	**2.2**	**2.66**	Data from 08.10.01 to 04.08.03 [sample point not monitored since 2003]
Ammonia	mg/l	**0.19**	**0.21**	Data from 08.10.01 to 04.08.03 [sample point not monitored since 2003]
Phosphate	mg/l	**0.02**	**0.01**	Data from 08.10.01 to 04.08.03 [sample point not monitored since 2003]

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**21250**	**7083**	Based on current permitted DWF of 17000 m3/day
Post Growth flow	m3/day	**-**	**-**	
BOD	mg/l	**2.59**	**1.47**	Since last step change 30.09.04 to 30.03.16
Ammonia	mg/l	**0.62**	**0.75**	Since last step change. 11.05.07 to 26.11.15
Phosphate	mg/l	**1.7**	**0.78**	Since last step change 28.01.15 to 30.03.16

Downstream WFD Targets

Salmonid Fishery (Y/N) ?	**N**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	High	**4.00**	**-**
Ammonia	High	**0.30**	**-**
Phosphate	Poor		**1.031**

2. Improve WFD Status

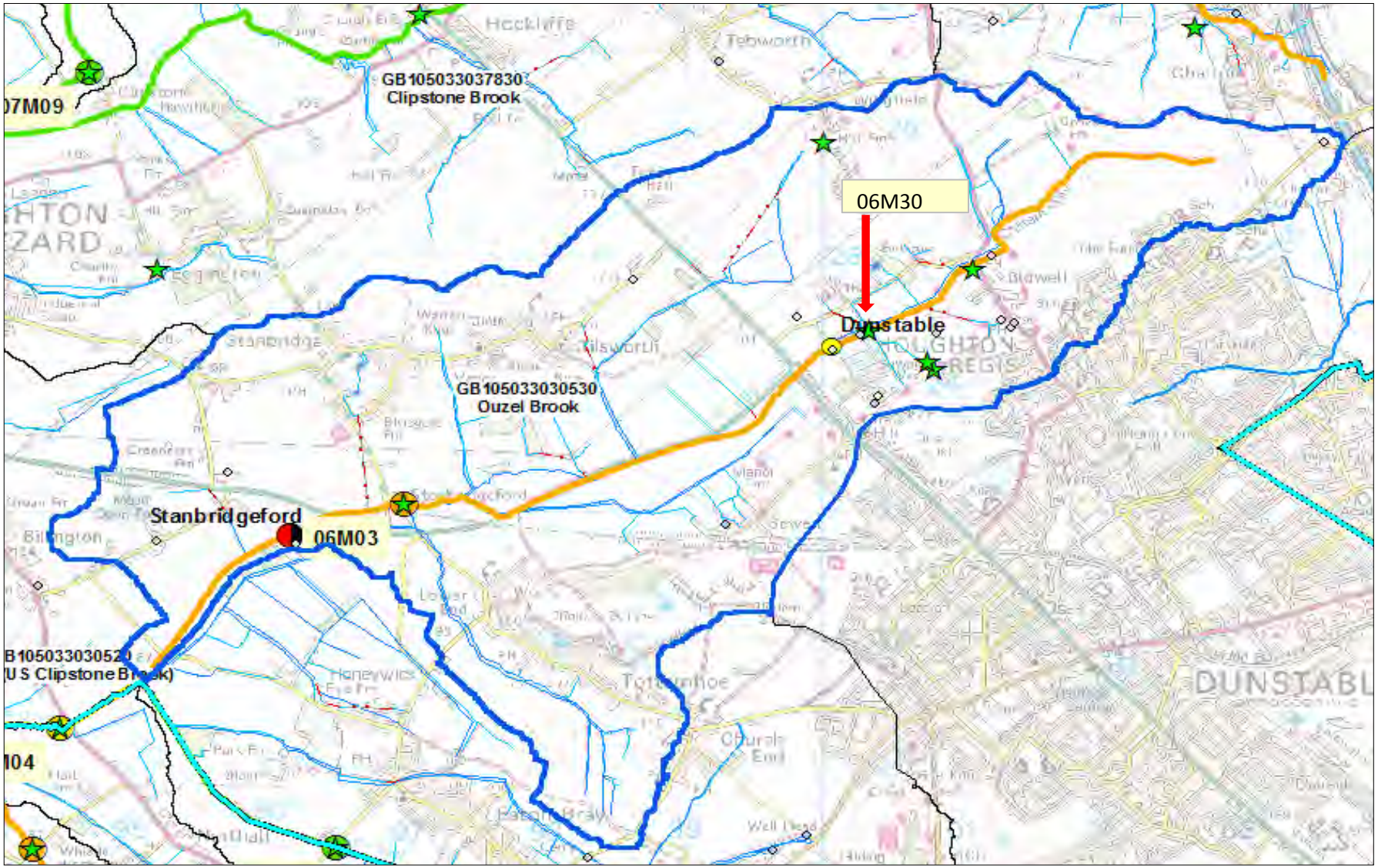
Variable	Status	(mg/l)	(mg/l)
Phosphate	Good	**-**	**0.075**
Phosphate	Moderate	**-**	**0.185**

Comments/Assumptions

No Deterioration assessments
RBMP2 status (based on 2012-2014 data at sample point 06M03):
BOD -High
Ammonia -High
Phosphate -Poor
- calculate permit limits required to maintain RBMP2 status at current permitted DWF and at '2031 DWF' incorporating proposed growth & development
(N.B. AMP6 WFD No Deterioration permit limit of 3 mg/l is now confirmed. The new permit will be effective from 1st April 2018)

Improve WFD Status assessments
- applies to phosphate element only
- calculate permit limit required to achieve Good status and Moderate status for current and 2031 DWF scenarios

N.B. Dunstable STW is also identified as a receptor for additional foul flows from Luton. Assessment needs to consider the cumulative discharge rate.


GB105033037830
Clipstone Brook
06M30
Dunstable
GB105033030530
Ouzel Brook
Stanbridgeford
06M03

Monte Carlo Datasheet - for Central Beds WCS, April 2016

Catchment	**Flitwick STW**
STW Point Code	FLITWCK
Date	
Receiving Water	Running Waters/Steppingley Brook
WFD Waterbody ID	GB105033037660 - Running Waters-Steppingley
Upstream Sample Point	16M07 - Running Waters, A5120 Rd Br, Flitwick. *Stopped sampling 2008*
Downstream Sample Point	16M15 - RUNNING WATERS A507 HOLLINGTON JUNCTION

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**8300**	-	AWCNF/2057
Post Growth DWF	m3/day		-	
BOD	mg/l	**15**	95 %ile	
Ammonia	mg/l	**5**	95 %ile	
Phosphate	mg/l	**2**	AA	*UWWTD SA(E) requirement - since 01/01/05*

Upstream River data

Variable	Unit	Mean	SD/Q95	Comments/Assumptions
Flow	m3/day	**8640**	**2160**	Low Flows 2000, 26/11/2007 (for AMP5 planning)
BOD	mg/l	**1.30**	**1.2**	Since last step change. 23/07/04 to 01/04/08 (no recent data)
Ammonia	mg/l	**0.06**	**0.062**	Since last step change. 23/04/04 to 01/04/08 (no recent data)
Phosphate	mg/l	**0.05**	**0.02**	Since last step change. 23/04/04 to 01/04/08 (no recent data)

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**10375**	**3458**	Based on permitted DWF
Post Growth flow	m3/day	**0**	**0**	
BOD	mg/l	**2.23**	**1.16**	Since last step change. 02/07/04 to 16/03/16
Ammonia	mg/l	**0.69**	**0.65**	Since last step change. 15/07/11 to 16/03/16
Phosphate	mg/l	**1.08**	**0.76**	Since last step change. 09/09/04 to 03/03/16

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **N**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	Good		-
Ammonia	Good	**0.60**	-
Phosphate	Poor	-	**1.037**

2. Improve WFD Status

Variable	Status	90 %ile (mg/l)	AA (mg/l)
Phosphate	Good	-	**0.076**
Phosphate	Moderate	-	**0.187**

Comments/Assumptions

<u>No Deterioration assessments</u>
RBMP2 status (based on 2013-2014 data at sample point 06M04 *(new sample point in 2013)*):
BOD - High
Ammonia - High
Phosphate - Poor

<u>Improve WFD Status assessments</u>
- applies to phosphate element only
- calculate permit limit required to achieve Good status and Moderate status
(assume mid-Good quality upstream: 0.059 mg/l mean & sd)

Central Beds WCS Assessment - Results

NO DETERIORATION ASSESSMENT

	Flitwick STW			
	BOD	Ammonia	Phosphate	
River Downstream of Discharge				
No Deterioration target	Good	Good	Poor	
Designated Salmonid Fishery ?	N	-	-	-
River quality target (90-percentile or AA)	0.00	0.60	1.037	

Current Consent

Current Permited DWF (m3/day)	8300		
Consent limits (95%ile or AA)	15	5	2

Discharge Quality Required - Current

Current Permited DWF (m3/day)	8300			
Effluent quality required (95%ile or AA)				

Discharge Quality Required - Post Growth

Pre-AMP5 DWF (m3/day)	0			
Effluent quality required (95%ile or AA)				

Key to 'Effluent Quality Required'

Green – no change to current consent required

Amber – consent tightening required, but within limits of conventional treatment processes

Red Value – not achievable within limits of conventional treatment processes

IMPROVEMENT TO WFD STATUS ASSESSMENT

	Flitwick STW			
			Phosphate	Phosphate
River Downstream of Discharge				
WFD Status target			Good	Moderate
Designated Salmonid Fishery ?	-	-	-	-
River quality target (90-percentile or AA)	-		0.076	0.187

Discharge Quality Required - Current

Current DWF (m3/day)	8300			
Effluent quality required (95%ile or AA)	-			

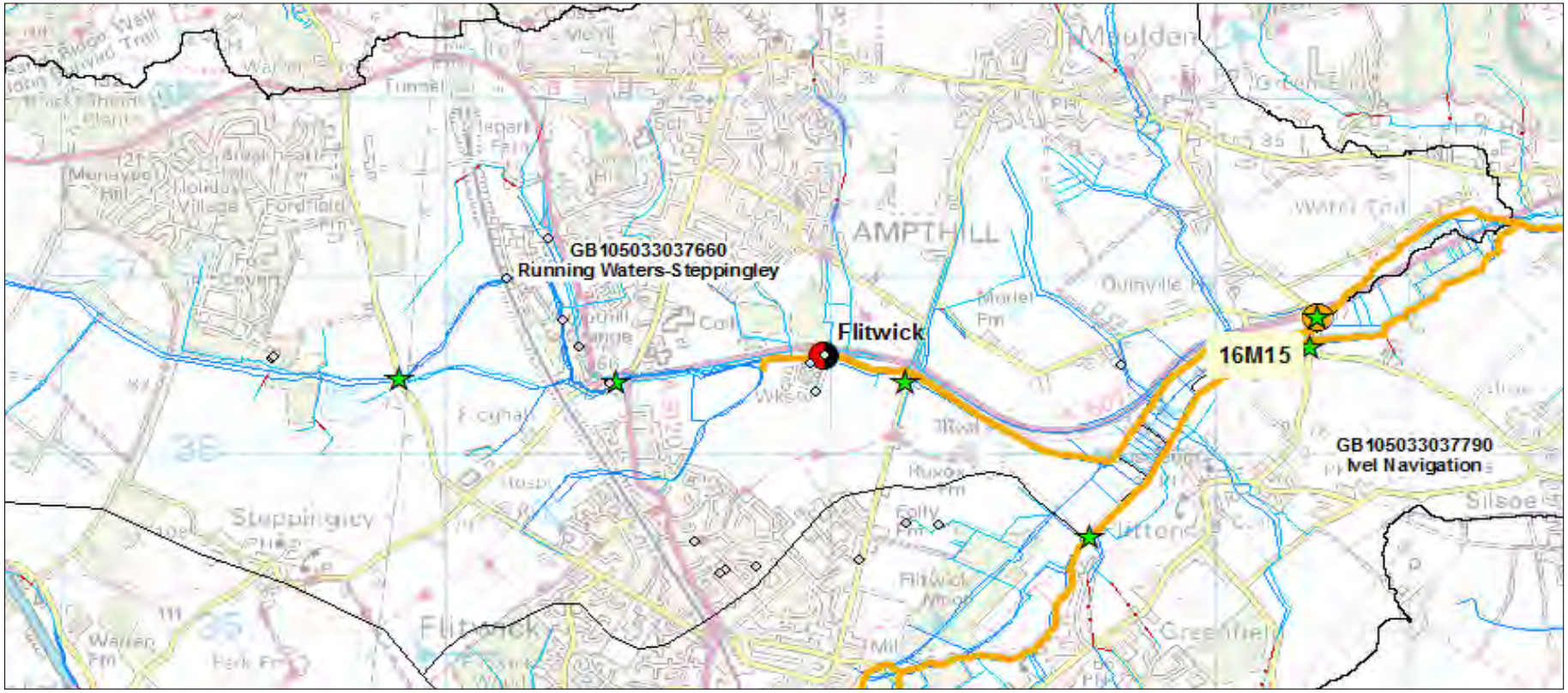
Discharge Quality Required - Post Growth

Pre-AMP5 DWF (m3/day)	0			
Effluent quality required (95%ile or AA)	-	-	-	-

PR14 Conclusion:

No Deterioration Assessment:

Improve WFD status assessment:


GB105033037660
Running Waters-Steppingley
Flitwick
16M15
GB105033037790
Ivel Navigation
AMPTHILL
Steppingley
Flitwick

Monte Carlo Datasheet - for Central Beds WCS, April 2016

Catchment	**Leighton Linslade**
STW Point Code	**LEIGHTN**
Date	
Receiving Water	River Ouzel
WFD Waterbody ID	GB105033037971 - Ouzel US Caldecote Mill
Upstream Sample Point	08M01 - R.OUZEL TOWN BRIDGE LEIGHTON
Downstream Sample Point	08M02 - R.OUZEL GRANGE MILL

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**7600**	-	AWCNF/10415
Post Growth DWF	m3/day			
BOD	mg/l	**60**	95 %ile	
Ammonia	mg/l	**30**	95 %ile	
Phosphate	mg/l	**2**	AA	UWWTD SA(E) requirement since 01/01/203

Upstream River data

Variable	Unit	Mean	SD/Q95	Comments/Assumptions
Flow	m3/day	**83030**	**5115**	From Low Flows Enterprise [H&T, Feb, 2013]
BOD	mg/l	**2.03**	**1.28**	No step changes: data from 25.01.00 to 11.12.07 ***No recent data***
Ammonia	mg/l	**0.1**	**0.12**	25.01.00 to 08.02.16 [3 outliers removed]
Phosphate	mg/l	**0.24**	**0.15**	Since last step change 23.11.07 to 08.02.16

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**9500**	**3167**	Based on current permitted DWF of 7600 m3/day
Post Growth flow	m3/day	**0**	**0**	
BOD	mg/l	**7.57**	**3.86**	Since last step change. 29.07.03 to 30.03.16
Ammonia	mg/l	**2.51**	**1.3**	Since last step change. 10.05.12 to 16.03.16
Phosphate	mg/l	**1.28**	**0.66**	total P, det 0348 since last step change 04.04.03 to 30.03.16

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **N**

Comments/Assumptions

<u>No Deterioration assessments</u>
RBMP status (based on 2006-2008 data at sample point 08M02):
BOD - High
Ammonia - Good
Phosphate - Poor
- calculate permit limits required to maintain RBMP status
08M02 no longer sampled for WFD classification

<u>Improve WFD Status assessments</u>
- applies to phosphate element only
- calculate permit limit required to achieve Good status and Moderate status
(assume mid-good quality upstream: mean and sd both 0.057 mg/l)

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	High	**4.00**	**-**
Ammonia	Good	**0.60**	**-**
Phosphate	Poor	**-**	**1.029**

2. Improve WFD Status

Variable	Status	90 %ile (mg/l)	AA (mg/l)
Phosphate	Good	**-**	**0.075**
Phosphate	Moderate	**-**	**0.185**

NO DETERIORATION' ASSESSMENT

	Leighton Linslade		
	BOD	Ammonia	Phosphate
River Downstream of Discharge			
No Deterioration target	High	Good	Poor
Designated Salmonid Fishery ?	N	-	-
River quality target (90-percentile or AA)	4.00	0.60	1.029

Current Consent

Current Permited DWF (m3/day)	7600		
Consent limits (95%ile or AA)	60	30	2

Discharge Quality Required

Current Permited DWF (m3/day)	7600		
Effluent quality required (95%ile or AA)			

IMPROVEMENT TO WFD STATUS' ASSESSMENT

	Leighton Linslade	
	Phosphate	Phosphate
River Downstream of Discharge		
WFD Status target	Good	Moderate
Designated Salmonid Fishery ?	-	-
River quality target (90-percentile or AA)	0.075	0.185

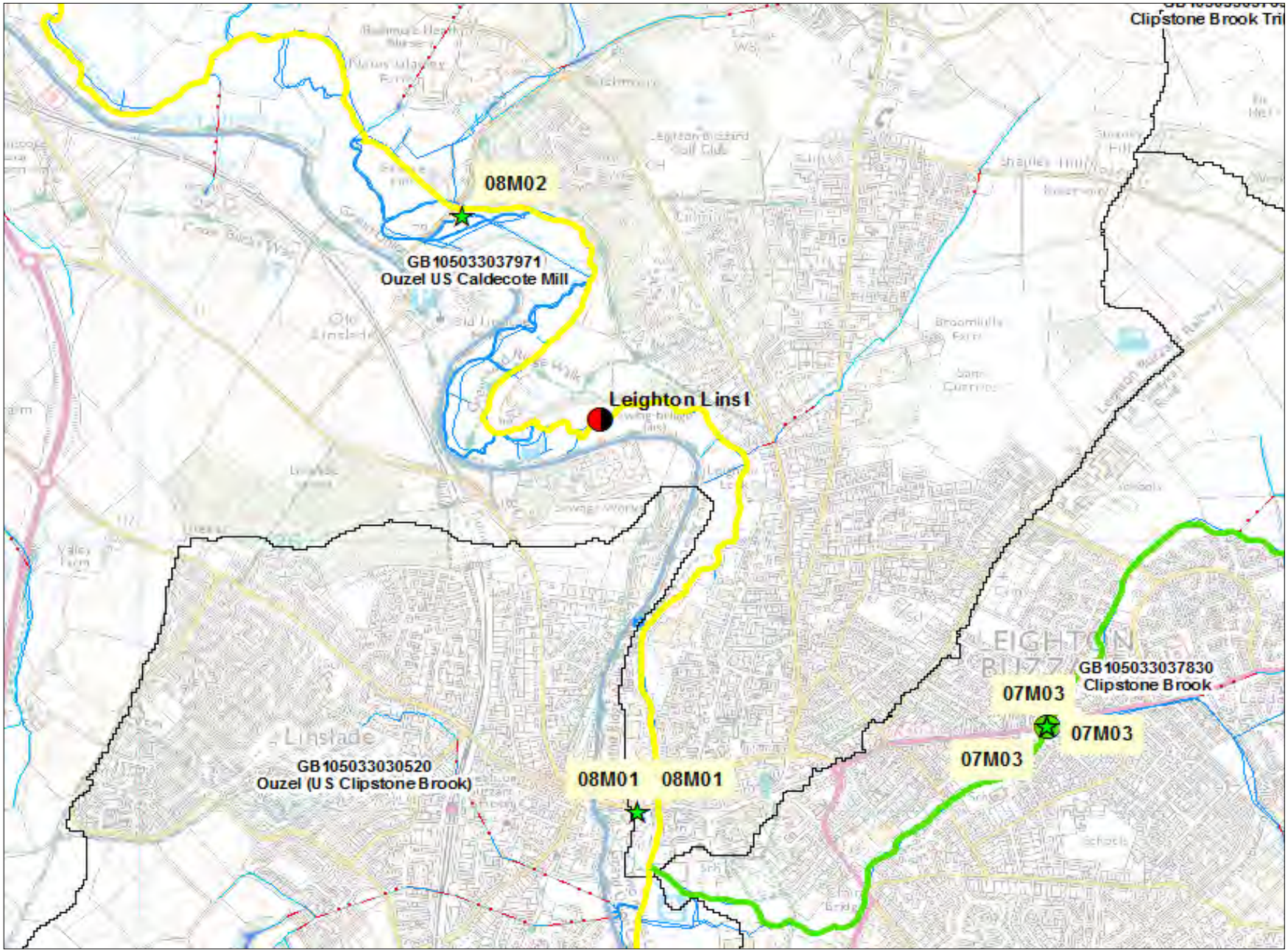
Discharge Quality Required - Current

Current DWF (m3/day)	7600	
Effluent quality required (95%ile or AA)		

PR14 Conclusion:

No Deterioration Assessment:

Improve WFD status assessment:


Clipstone Brook Tri
08M02
GB105033037971
Ouzel US Caldecote Mill
Leighton Linsl
GB105033037830
Clipstone Brook
07M03
07M03
07M03
GB105033030520
Ouzel (US Clipstone Brook)
08M01
08M01

Monte Carlo Datasheet - for Central Beds WCS, April 2016

Catchment	**Poppy Hill STW**
STW Point Code	POPPY H
Date	
Receiving Water	River Ivel
WFD Waterbody ID	GB105033038170 - Ivel (Langford to Roxton)
Upstream Sample Point	No suitable sample point (discharge imm d/s confluence)
Downstream Sample Point	15M01 - R.IVEL A6001 RD.BR.LANGFORD

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**4700**	-	AW1NF/2418
Post Growth DWF	m3/day		-	
BOD	mg/l	**20**	95 %ile	
Ammonia	mg/l	**8**	95 %ile	
Phosphate	mg/l	**2**	AA	UWWTD SA(E),effective 01/01/09

Upstream River data

Variable	Unit	Mean	SD	Comments/Assumptions
Flow	m3/day	**99532**	**38880**	From STW file - no attribution
BOD	mg/l	**1.15**	**0.69**	No suitable sample point - assume mid-High quality
Ammonia	mg/l	**0.09**	**0.05**	No suitable sample point - assume mid-High quality
Phosphate	mg/l	**0.070**	**0.070**	No suitable sample point - assume mid-Good quality

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**5875**	**1958**	Based on DWF of 4700 m3/day
Post Growth flow	m3/day	**0**	**0**	
BOD	mg/l	**6.5**	**2.72**	Since last step change. 28.07.05 to 24.03.16
Ammonia	mg/l	**2.13**	**1.07**	Since last step change. 05.07.06 to 23.03.16
Phosphate	mg/l	**1.42**	**0.42**	Since last step change. 03.12.13 to 24.03.16

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **N**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	High	**4.00**	**-**
Ammonia	High	**0.30**	**-**
Phosphate	Moderate	**-**	**0.212**

2. Improve WFD Status

Variable	Status	90 %ile (mg/l)	AA (mg/l)
Phosphate	Good	**-**	**0.090**

Comments/Assumptions

No Deterioration assessments
RBMP2 status (based on 2012-2014 data at sample point 15M01):
BOD - High
Ammonia - High
Phosphate - Moderate
- calculate permit limits required to maintain RBMP2 status

Improve WFD Status assessments
- applies to phosphate element only
- calculate permit limit required to achieve Good status

WCS Assessment - Results

NO DETERIORATION ASSESSMENT

	Poppy Hill STW		
	BOD	Ammonia	Phosphate
River Downstream of Discharge			
No Deterioration target	High	High	Moderate
Designated Salmonid Fishery ?	N	-	-
River quality target (90-percentile or AA)	4.00	0.30	0.212
Current Consent			
Current Permited DWF (m3/day)	4700		
Consent limits (95%ile or AA)	20	8	2
Discharge Quality Required			
Current Permited DWF (m3/day)	4700		
Effluent quality required (95%ile or AA)			
Discharge Quality Required			
Post Growth DWF (m3/day)	0		
Effluent quality required (95%ile or AA)			

Key to 'Effluent Quality Required'

Green – no change to current consent required

Amber – consent tightening required, but within limits of conventional treatment processes

Red Value – not achievable within limits of conventional treatment processes

IMPROVEMENT TO WFD STATUS ASSESSMENT

	Poppy Hill STW		
		Phosphate	
River Downstream of Discharge			
WFD Status target		Good	
Designated Salmonid Fishery ?		-	
River quality target (90-percentile or AA)		0.090	
Discharge Quality Required - Current Permitted DWF			
Current DWF (m3/day)	4700		
Effluent quality required (95%ile or AA)			
Discharge Quality Required - Post Growth DWF			
Pre-AMP5 DWF (m3/day)	0		
Effluent quality required (95%ile or AA)			

PR14 Conclusion:

No Deterioration Assessment:

PR14 No Deterioration schemes to be considered:

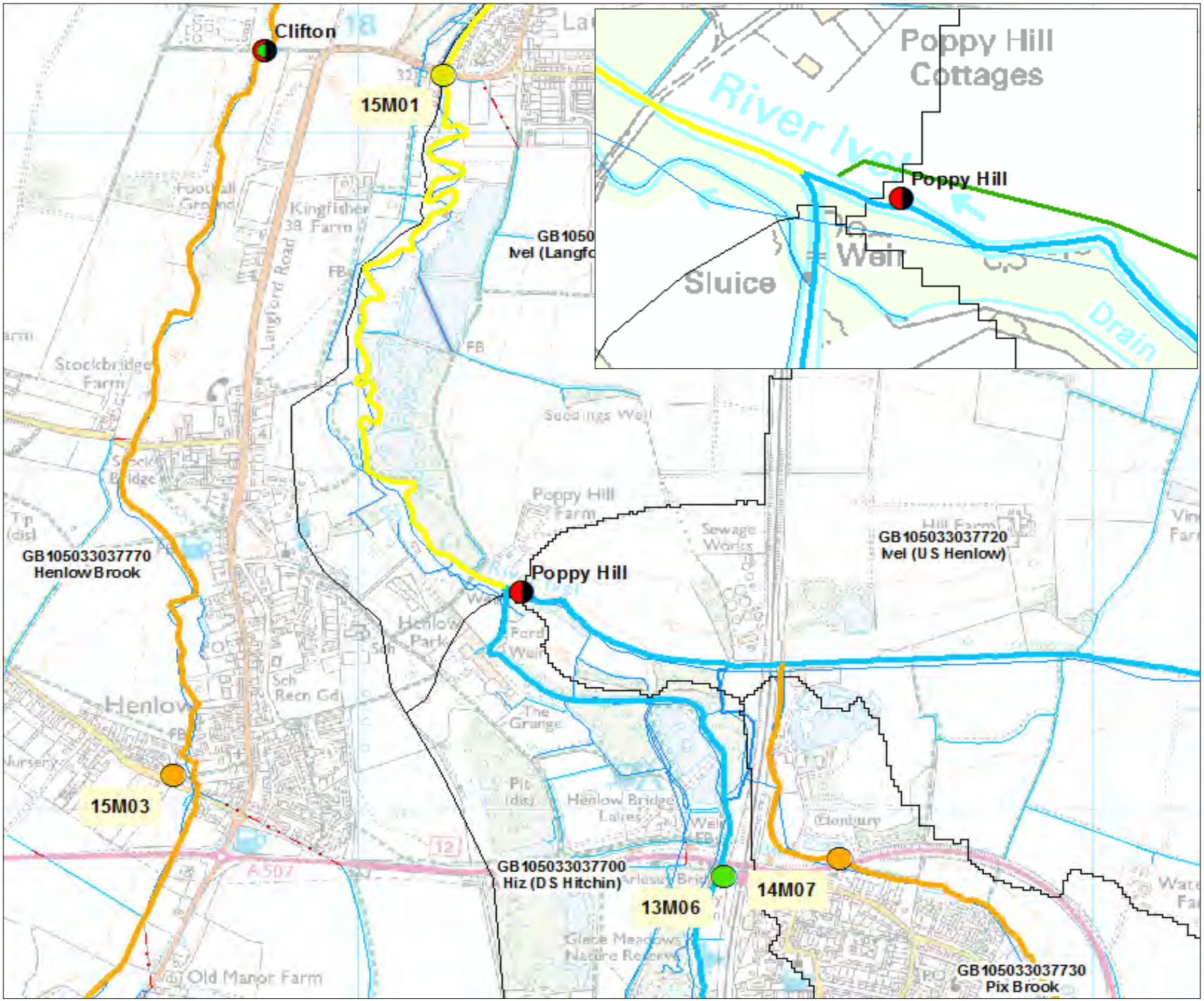
BOD - **no scheme necessary**

Ammonia 3 mg/l 95 %ile

Phosphate 0.5 mg/l AA.

Improve WFD status assessment:

A discharge at **0.5 mg/l AA** is predicted to result in an imporvement to Good phosphate status downstream.


Clifton
15M01
GB1050
Ivel (Langfo
Poppy Hill
Cottages
River Ivel
Poppy Hill
Weir
Sluice
Drain
Stockbridge Farm
Langford Road
Kingfisher 38 Farm
Football Ground
Seddings Well
Poppy Hill Farm
Sewage Works
GB105033037720
Ivel (U S Henlow)
GB105033037770
Henlow Brook
Poppy Hill
Henlow Park
Ford Well
Sch Recn Gd
Henlow
The Grange
Pit (dis)
Henlow Bridge Lakes
Glenbury
15M03
A507
GB105033037700
Hiz (D S Hitchin)
13M06
14M07
Glace Meadows Nature Reserve
Old Manor Farm
GB105033037730
Pix Brook

Monte Carlo Datasheet - for Central Beds WCS, April 2016

Catchment	**Potton STW**
STW Point Code	**POTTON**
Date	
Receiving Water	Sutton Brook, then Millbridge/Common Brook
WFD Waterbody ID	GB105033037820 Millbridge-Common Brooks
Upstream Sample Point	19M14 - MILLBRIDGE BK.IVEL B1042 RD.BR.POTTON
Downstream Sample Point	19M19 - MILLBRIDGE BK.TRIB.IVEL SUTTON FORD

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**1200**	-	AW1NF/975
Post Growth DWF	m3/day			
BOD	mg/l	**15**	95 %ile	
Ammonia	mg/l	**8**	95 %ile	
Phosphate	mg/l	**1**	AA	AMP5 HD P-removal Scheme effective 01/01/10

Upstream River data

Variable	Unit	Mean	SD	Comments/Assumptions
Flow	m3/day	**9417.60**	**2220.48**	Low Flows Enterprise [H&T, jan 2013)
BOD	mg/l	**1.89**	**1.16**	No step changes, outlier >35mg/l removed. 18/01/2000 to 15/08/2007
Ammonia	mg/l	**0.21**	**0.22**	Since last step change. 17.01.07 to 03.05.16
Phosphate	mg/l	**0.07**	**0.04**	Since last step change. 05.11.09 to 03.05.16

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**1500**	**500**	Based on current permitted DWF of 1200 m3/day
Post Growth flow	m3/day	**0**	**0**	
BOD	mg/l	**2.71**	**1.12**	Since last step change. 07/12/2009 to 17/03/16
Ammonia	mg/l	**2.25**	**2.02**	No step change, all data 18.01.00 to 17.03.16
Phosphate	mg/l	**0.52**	**0.28**	Post p-removal. 15/03/10 to 17/03/2016

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **N**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	High	**4.00**	**-**
Ammonia	Good	**0.60**	**-**
Phosphate	Moderate	**-**	**0.176**

2. Improve WFD Status

Variable	Status	90 %ile (mg/l)	AA (mg/l)
		-	**-**
Phosphate	Good	**-**	**0.070**

Comments/Assumptions

No Deterioration assessments
RBMP2 status (based on 2006-2008 data at sample point 19M19):
BOD - High
Ammonia - Good *(Moderate status recorded in RBMP2, but No Deterioration obligation means target remains Good status)*
Phosphate - Moderate
- calculate permit limits required to maintain RBMP status

Improve WFD Status assessments
- applies to phosphate element only
- calculate permit limit required to achieve Good status
(assume mid-Good upstream quality : mean 0.054 mg/l, sd 0.054 mg/l)

NO DETERIORATION' ASSESSMENT

	Potton STW		
	BOD	Ammonia	Phosphate
River Downstream of Discharge			
No Deterioration target	High	Good	Moderate
Designated Salmonid Fishery ?	N	-	-
River quality target (90-percentile or AA)	4.00	0.60	0.18

Current Consent

Current Permited DWF (m3/day)	1200		
Consent limits (95%ile or AA)	15	8	1

Discharge Quality Required - Current DWF

Current Permited DWF (m3/day)	1200		
Effluent quality required (95%ile or AA)			

Discharge Quality Required - Post Growth DWF

Pre-AMP5 DWF (m3/day)	0		
Effluent quality required (95%ile or AA)			

IMPROVEMENT TO WFD STATUS' ASSESSMENT - N/A

	Potton STW		
	BOD	Ammonia	Phosphate
River Downstream of Discharge			
WFD Status target	Good	Good	Good
Designated Salmonid Fishery ?	N	-	-
River quality target (90-percentile or AA)	-	-	0.070

Discharge Quality Required - Current

Current DWF (m3/day)	1200		
Effluent quality required (95%ile or AA)	-	-	

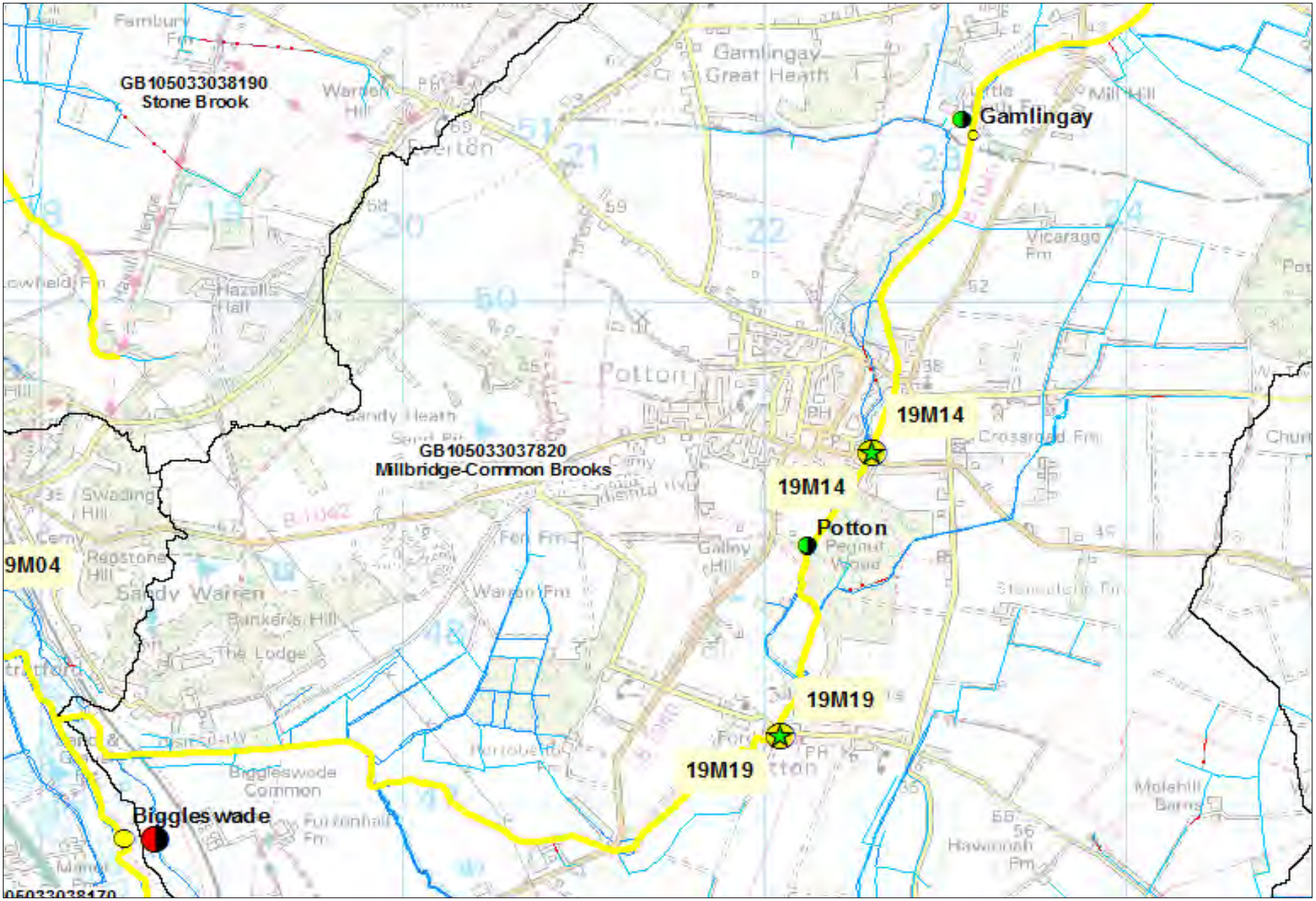
Discharge Quality Required - Post Growth DWF

Future DWF (m3/day)	0		
Effluent quality required (95%ile or AA)	-	-	

WCS Conclusion:

No Deterioration Assessment:

Improve WFD status assessment:


GB105033038190
Stone Brook
Gamlingay
GB105033037820
Millbridge-Common Brooks
19M14
19M14
Potton
19M19
19M19
9M04
Biggleswade

Monte Carlo Datasheet - for Central Beds WCS, April 2016

Catchment	**Sandy STW**
STW Point Code	SANDY
Date	
Receiving Water	River Ivel
WFD Waterbody ID	GB105033038170
Upstream Sample Point	19M04, R.IVEL NEW ROAD BEESTON
Downstream Sample Point	19M07, R.IVEL TEMPSFORD DEPOT FT.BR.

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**2200**	-	AW1NF/759
Post Growth DWF	m3/day		-	
BOD	mg/l	**40**	95 %ile	
Ammonia	mg/l	**13**	95 %ile	
Phosphate	mg/l	**2**	AA	*UWWTD SA(E) requirement, effective 01/05/05*

Upstream River data

Variable	Unit	Mean	SD/Q95	Comments/Assumptions
Flow	m3/day	**228096**	**79661**	Low Flows Enterprise, from H&T March 2013
BOD	mg/l	**1.29**	**0.75**	Since last step change 10/06/04 to 01/05/14
Ammonia	mg/l	**0.11**	**0.11**	No step change. Date range 18/01/00 to 31/03/16
Phosphate	mg/l	**0.19**	**0.06**	Since last step change 16/12/08 to 31/03/16

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**2750**	**917**	Based on post-'flow' scheme DWF
Post Growth flow	m3/day	**0**	**0**	
BOD	mg/l	**12.11**	**6.63**	No step change. Date range 18/01/00 to 18/03/16
Ammonia	mg/l	**3.41**	**2.75**	Since last step change. 21/07/06 to 17/03/16
Phosphate	mg/l	**1.35**	**0.59**	Since last step change. 16/12/04 to 18/03/16

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **Y**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	High	**3.00**	**-**
Ammonia	High	**0.30**	**-**
Phosphate	Moderate	**-**	**0.212**

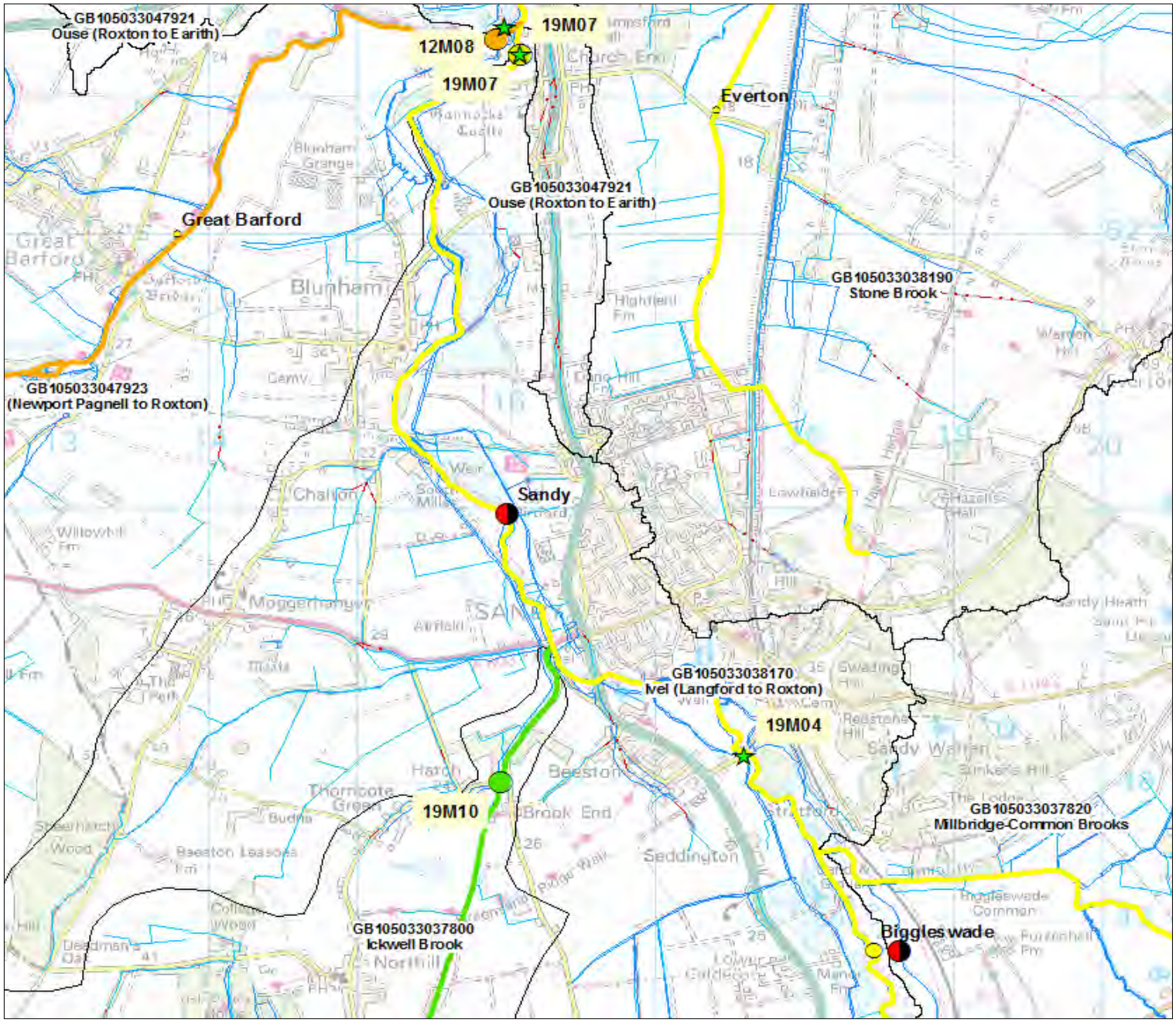
2. Improve WFD Status

Variable	Status	90 %ile (mg/l)	AA (mg/l)
Phosphate	Good	**-**	**0.090**

Comments/Assumptions

<u>No Deterioration assessments</u>
RBMP status (based on 2012-2014 data at sample point 19M07):
BOD - High
Ammonia - High
Phosphate - Moderate
- calculate permit limits required to maintain RBMP status

<u>Improve WFD Status assessments</u>
- **applies to phosphate element only**
- calculate permit limit required to achieve Good status
(assume mid-Good quality upstream: mean & sd 0.07 mg/l)


GB105033047921
Ouse (Roxton to E arith)
19M07
12M08
19M07
Everton
GB105033047921
Ouse (Roxton to E arith)
Great Barford
GB105033038190
Stone Brook
GB105033047923
(Newport Pagnell to Roxton)
Sandy
GB105033038170
Ivel (Langford to Roxton)
19M04
19M10
GB105033037820
Millbridge-Common Brooks
GB105033037800
Ickwell Brook
Biggleswade

Monte Carlo Datasheet - for Central Beds WCS, April 2016

Catchment	**Shillington STW**
STW Point Code	SHILLTN
Date	
Receiving Water	Campton Brook
WFD Waterbody ID	GB105033037750
Upstream Sample Point	N/A - discharge immediately d/s multiple confluence - see map
Downstream Sample Point	17M02, CAMPTON BK.SOUTH BRIDGE SHEFFORD

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**1204**	-	AW1NF/693
Post Growth DWF	m3/day		-	
BOD	mg/l	**40**	95 %ile	
Ammonia	mg/l	**15**	95 %ile	
Phosphate	mg/l	**-**	AA	

Upstream River data

Variable	Unit	Mean	SD	Comments/Assumptions
Flow	m3/day	**8813**	**1547**	From H&T, Low Flows Enterprise, March 2013
BOD	mg/l	**1.15**	**0.69**	No data - assume mid-High status
Ammonia	mg/l	**0.09**	**0.05**	No data - assume mid-High status
Phosphate	mg/l	**0.067**	**0.067**	No data - assume mid-Good status

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**1505**	**502**	Based on post-'flow' scheme DWF of 1204 m3/day
Post growth flow	m3/day	**0**	**0**	
BOD	mg/l	**16.95**	**6.35**	All data 24.01.00 to 16.03.16 (one outlier removed)
Ammonia	mg/l	**4.69**	**3.44**	All data 24.01.00 to 16.03.16 (one outlier removed)
Phosphate	mg/l	**4.45**	**1.87**	Since last step change. 24.04.08 to 09.10.13 [no OSM data]

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **N**

1. No Deterioration

Variable	Status	(mg/l)	(mg/l)
BOD	High	**4.00**	**-**
Ammonia	High	**0.30**	**-**
Phosphate	Poor	**-**	**1.077**

2. Improve WFD Status

Variable	Status	(mg/l)	(mg/l)
Phosphate	Good	**-**	**0.086**
Phosphate	Moderate	**-**	**0.206**

Comments/Assumptions

No Deterioration assessments
RBMP2 status (based on 20121-2014 data at sample point 17M02):
BOD - High
Ammonia - High
Phosphate - Poor
- calculate permit limits required to maintain RBMP status

Improve WFD Status assessments
- applies to Phosphate element only
- calculate permit limit required to achieve Good and Moderate status

WCS Assessment - Results

NO DETERIORATION ASSESSMENT

	Shillington STW		
	BOD	Ammonia	Phosphate
River Downstream of Discharge			
No Deterioration target	High	High	Poor
Designated Salmonid Fishery ?	N	-	-
River quality target (90-percentile or AA)	4.00	0.30	1.077

Current Consent

Current Permited DWF (m3/day)	1204		
Consent limits (95%ile or AA)	40	15	-

Discharge Quality Required - Current DWF

Current Permited DWF (m3/day)	1204		
Effluent quality required (95%ile or AA)			

Discharge Quality Required - Post Growth

Post Growth DWF (m3/day)	0		
Effluent quality required (95%ile or AA)			

IMPROVEMENT TO WFD STATUS ASSESSMENT

	Shillington STW		
	Phosphate	Phosphate	
River Downstream of Discharge			
WFD Status target	Good	Moderate	
Designated Salmonid Fishery ?	-	-	
River quality target (90-percentile or AA)	0.086	0.206	

Discharge Quality Required - Current Permitted DWF

Current DWF (m3/day)	1204		
Effluent quality required (95%ile or AA)			

Discharge Quality Required - Post Growth DWF

Pre-AMP5 DWF (m3/day)	0		
Effluent quality required (95%ile or AA)			

Key to 'Effluent Quality Required'

Green – no change to current consent required

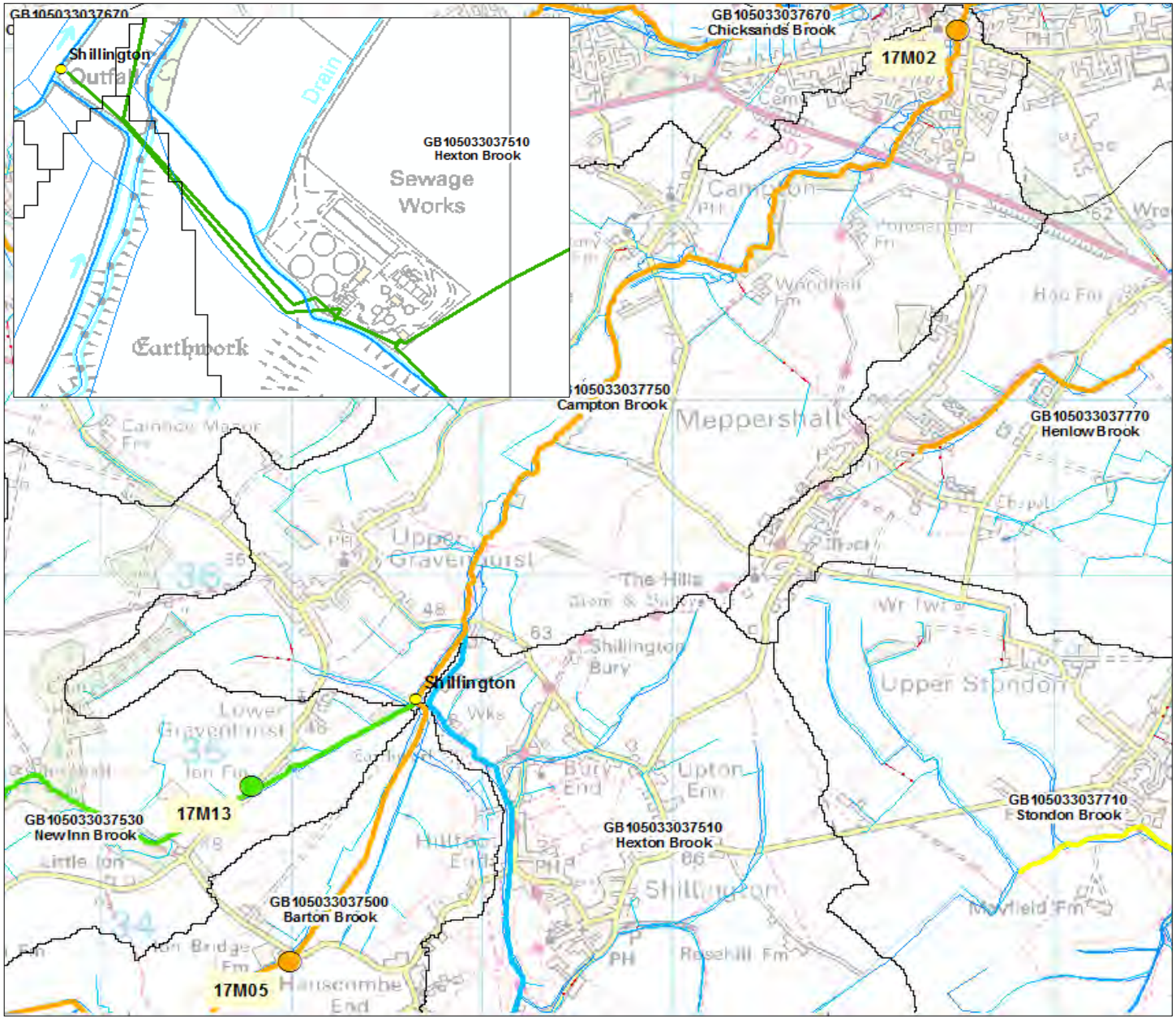
Amber – consent tightening required, but within limits of conventional treatment processes

Red Value – not achievable within limits of conventional treatment processes

PR14 Conclusion:

No Deterioration Assessment:

Improve WFD status assessment:


GB105033037670
Chicksands Brook
17M02
Shillington
Outfall
Drain
GB105033037510
Hexton Brook
Sewage
Works
Earthwork
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Campton Brook
Meppershall
GB105033037770
Henlow Brook
Upper
Gravenhurst
The Hills
Shillington
Bury
Upper Stondon
Lower
Gravenhurst
17M13
GB105033037530
New Inn Brook
Little Ion
Bury
End
Upton
End
GB105033037710
Stondon Brook
GB105033037510
Hexton Brook
Shillington
Moffield Fm
GB105033037500
Barton Brook
17M05
Hanscombe
End
Rosehill Fm

Monte Carlo Datasheet - for Central Beds WCS, April 2016

Catchment	**Stanbridgeford STW**
STW Point Code	**STANBFD**
Date	
Receiving Water	Ouzel Brook
WFD Waterbody ID	GB105033030530
Upstream Sample Point	06M03 - OUZEL BK.TRIB.OUZEL STANBRIDGEFORD
Downstream Sample Point	06M04 - OUZEL BK.TRIB.OUZEL A4146 R/B.BILLINGTON

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**2482**	-	AW1NF/2574
Post Growth DWF	m3/day			
BOD	mg/l	**20**	95 %ile	
Ammonia	mg/l	**12**	95 %ile	
Phosphate	mg/l	**2**	AA	UWWTD SAE P removal, effective 2004

Upstream River data

Variable	Unit	Mean	SD	Comments/Assumptions
Flow	m3/day	**9504**	**950**	Flows from Low Flows Enterprise [H&T Oct 2012)
BOD	mg/l	**1.47**	**0.87**	Since last step change. 25.08.04 to 26.11.07 [ceased sampling for BOD 2007]
Ammonia	mg/l	**0.1**	**0.13**	Since last step change. 21.07.11 to 13.04.16.
Phosphate	mg/l	**0.43**	**0.35**	Since last step change. 13.08.02 to 13.04.16

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**3103**	**1034**	Based on current permitted DWF of 2482 m3/day
Post Growth flow	m3/day	**0**	**0**	
BOD	mg/l	**2.19**	**1.12**	Since last step change. 09.02.12 to 30.03.16
Ammonia	mg/l	**0.33**	**0.43**	Since last step change. 11.03.05 to 16.03.16
Phosphate	mg/l	**0.63**	**0.59**	Since last step change 10.12.08 to 30.03.16 (Total P)

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **N**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	High	**4.00**	**-**
Ammonia	High	**0.30**	**-**
Phosphate	Poor	**-**	**1.036**

2. Improve WFD Status

Variable	Status	90 %ile (mg/l)	AA (mg/l)
Phosphate	Good	**-**	**0.076**
Phosphate	Moderate	**-**	**0.187**

Comments/Assumptions

No Deterioration assessments
RBMP2 status (based on 2012-2014 data at sample point 06M04):
BOD - High
Ammonia - High
Phosphate - Poor (downstrean sample point is Moderate status, but is influenced by Good status of Eaton Bray Brook - see map)
- calculate permit limits required to maintain RBMP2 status

Improve WFD Status assessments
- applies to phosphate element only
- calculate permit limit required to achieve Good and Moderate status (assume mid-Good upstream quality : mean 0.059 mg/l, sd 0.059 mg/l)

****Works is currently flow non-compliant - 2014 measured DWF 2871 m3/day****

NO DETERIORATION' ASSESSMENT

	Stanbridgeford STW		
	BOD	Ammonia	Phosphate
River Downstream of Discharge			
No Deterioration target	High	High	Poor
Designated Salmonid Fishery ?	N	-	-
River quality target (90-percentile or AA)	4.00	0.30	1.036
Current Consent			
Current Permited DWF (m3/day)	2482		
Consent limits (95%ile or AA)	20	12	2
Discharge Quality Required			
Current Permited DWF (m3/day)	2482		
Effluent quality required (95%ile or AA)			
Discharge Quality Required			
Post Growth DWF (m3/day)	0		
Effluent quality required (95%ile or AA)	-	-	-

IMPROVEMENT TO WFD STATUS' ASSESSMENT

	Stanbridgeford STW		
		Phosphate	Phosphate
River Downstream of Discharge			
WFD Status target		Good	Moderate
Designated Salmonid Fishery ?		N	N
River quality target (90-percentile or AA)		0.076	0.187
Discharge Quality Required - Current			
Current DWF (m3/day)	2482		
Effluent quality required (95%ile or AA)	-		
Discharge Quality Required - Future			
Post Growth DWF (m3/day)	0		
Effluent quality required (95%ile or AA)	-	-	-

PR14 Conclusion:

No Deterioration Assessment:

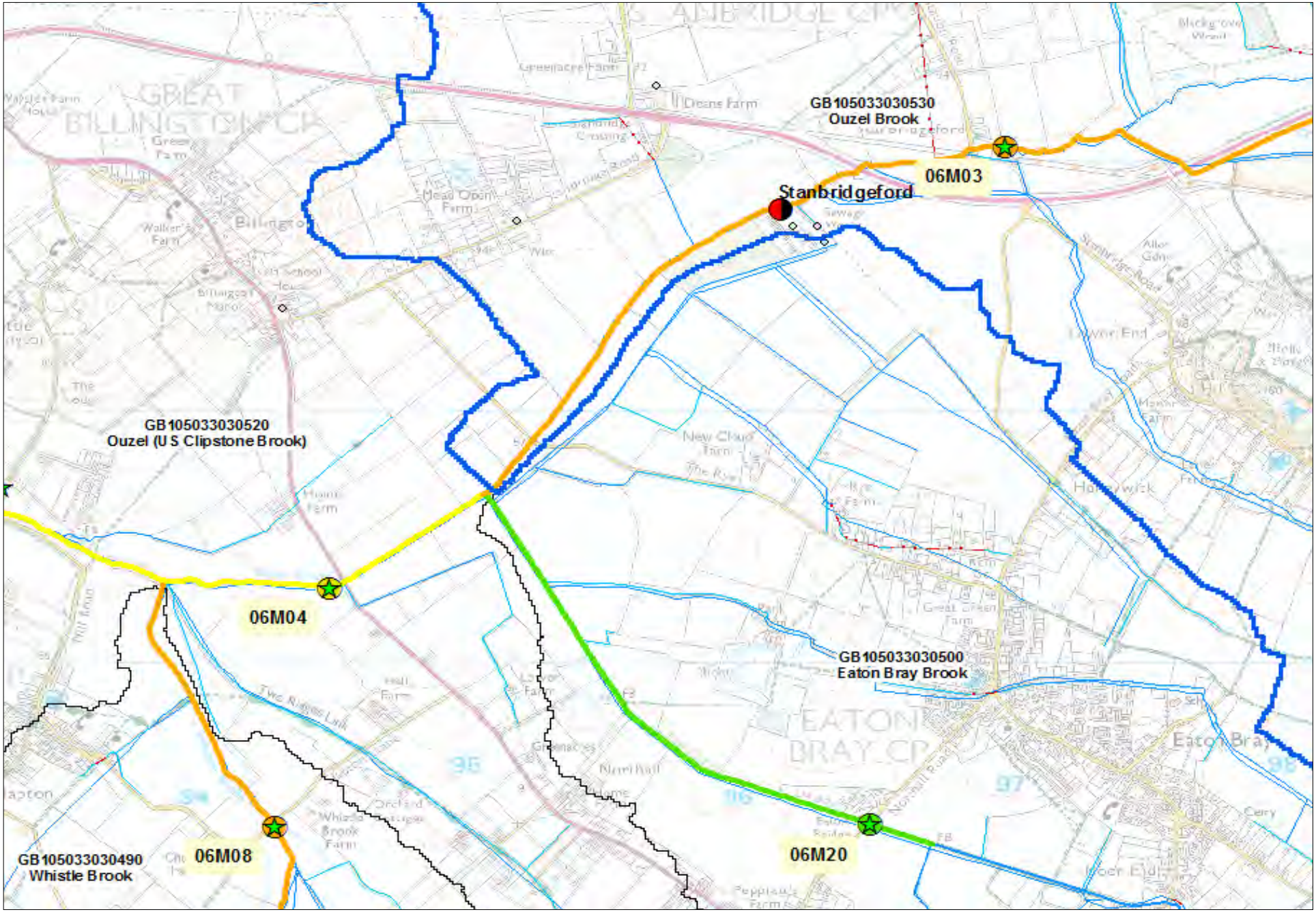
Improve WFD status assessment:

Key to 'Effluent Quality Required'

Green – no change to current consent required

Amber – consent tightening required, but within limits of conventional treatment processes

Red Value – not achievable within limits of conventional treatment processes


GB105033030530
Ouzel Brook
06M03
Stanbridgeford
GB105033030520
Ouzel (U S Clipstone Brook)
06M04
GB105033030500
Eaton Bray Brook
06M08
06M20
GB105033030490
Whistle Brook

Monte Carlo Datasheet - for Central Beds WCS, April 2016

Catchment	**Tempsford STW**
STW Point Code	TEMPSFO
Date	
Receiving Water	Stone brook, trib of River Great Ouse
WFD Waterbody ID	GB105033038190 - Stone Brook
Upstream Sample Point	None
Downstream Sample Point	20M07 - STONE BK.TRIB.OUSE STONE BR.B1043 RD.BR.

STW Permit limits

Variable	Unit	Limit	Statistic	**Permit Number**
Permitted DWF	m3/day	**700**	-	AWCNF/1223
Post Growth DWF	m3/day		-	
BOD	mg/l	**20**	95 %ile	
Ammonia	mg/l	**3.5**	95 %ile	*AMP6 WFD scheme to be in place by 31/03/20*
Phosphate	mg/l	**1**	AA	*AMP4 HD scheme - since 01/01/10*

Upstream River data

Variable	Unit	Mean	SD	Comments/Assumptions
Flow	m3/day	**8035**	**1088**	Low Flows Enterprise, validated by spot sampling. Jan 2015
BOD	mg/l	**1.86**	**1.12**	No data - assume mid-High status
Ammonia	mg/l	**0.07**	**0.04**	No data - assume mid-High status
Phosphate	mg/l	**0.069**	**0.069**	No data - assume mid-Good status.

STW discharge data

Variable	Unit	Mean	SD	Comments/Assumptions
Permitted Flow	m3/day	**875**	**292**	Based on current permitted (post-AMP5) DWF
Post Growth flow	m3/day	**0**	**0**	Based on pre-AMP5 DWF
BOD	mg/l	**5.66**	**4.85**	Since last step change. 08/08/06 to 17/03/16
Ammonia	mg/l	**1.95**	**1.66**	Since last step change. 15/10/09 to 17/03/16
Phosphate	mg/l	**0.44**	**0.19**	Since last step change. 10/01/12 to 17/03/16

Downstream WFD Targets

Salmonid Fishery (Y/N) ? **N**

1. No Deterioration

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	Moderate	**6.50**	**-**
Ammonia	Good	**2.50**	**-**
Phosphate	Moderate	**-**	**0.211**

2. Improve WFD Status

Variable	Status	90 %ile (mg/l)	AA (mg/l)
BOD	Good	**5**	-
Phosphate	Good	**-**	**0.089**

Comments/Assumptions

<u>No Deterioration assessments</u>
RBMP2 status (based on 2013-2014 data at sample point 20M07):
BOD - Moderate
Ammonia - Poor (**Good status predicted following AMP6 WFD scheme)**
Phosphate - Moderate
- calculate permit limits required to maintain RBMP2 status

<u>Improve WFD Status assessments</u>
- applies to BOD and Phosphate elements only
- calculate permit limit required to achieve Good status for BOD and Phosphate

WCS Assessment - Results

NO DETERIORATION ASSESSMENT

	Tempsford STW		
	BOD	Ammonia	Phosphate
River Downstream of Discharge			
No Deterioration target	Moderate	Good	Moderate
Designated Salmonid Fishery ?	N	-	-
River quality target (90-percentile or AA)	6.50	2.50	0.211

Current Consent

Current Permited DWF (m3/day)		700	
Consent limits (95%ile or AA)	20	3.5	1

Discharge Quality Required - Current

Current Permited DWF (m3/day)		700	
Effluent quality required (95%ile or AA)			

Discharge Quality Required - Growth

Pre-AMP5 DWF (m3/day)		0	
Effluent quality required (95%ile or AA)	-		

Key to 'Effluent Quality Required'

Green – no change to current consent required

Amber – consent tightening required, but within limits of conventional treatment processes

Red Value – not achievable within limits of conventional treatment processes

IMPROVEMENT TO WFD STATUS ASSESSMENT

	Tempsford STW		
	BOD	Phosphate	
River Downstream of Discharge			
WFD Status target	Good	Good	
Designated Salmonid Fishery ?	-	-	
River quality target (90-percentile or AA)	5.00	0.09	

Discharge Quality Required - Current Permitted DWF

Current DWF (m3/day)		700	
Effluent quality required (95%ile or AA)	-		

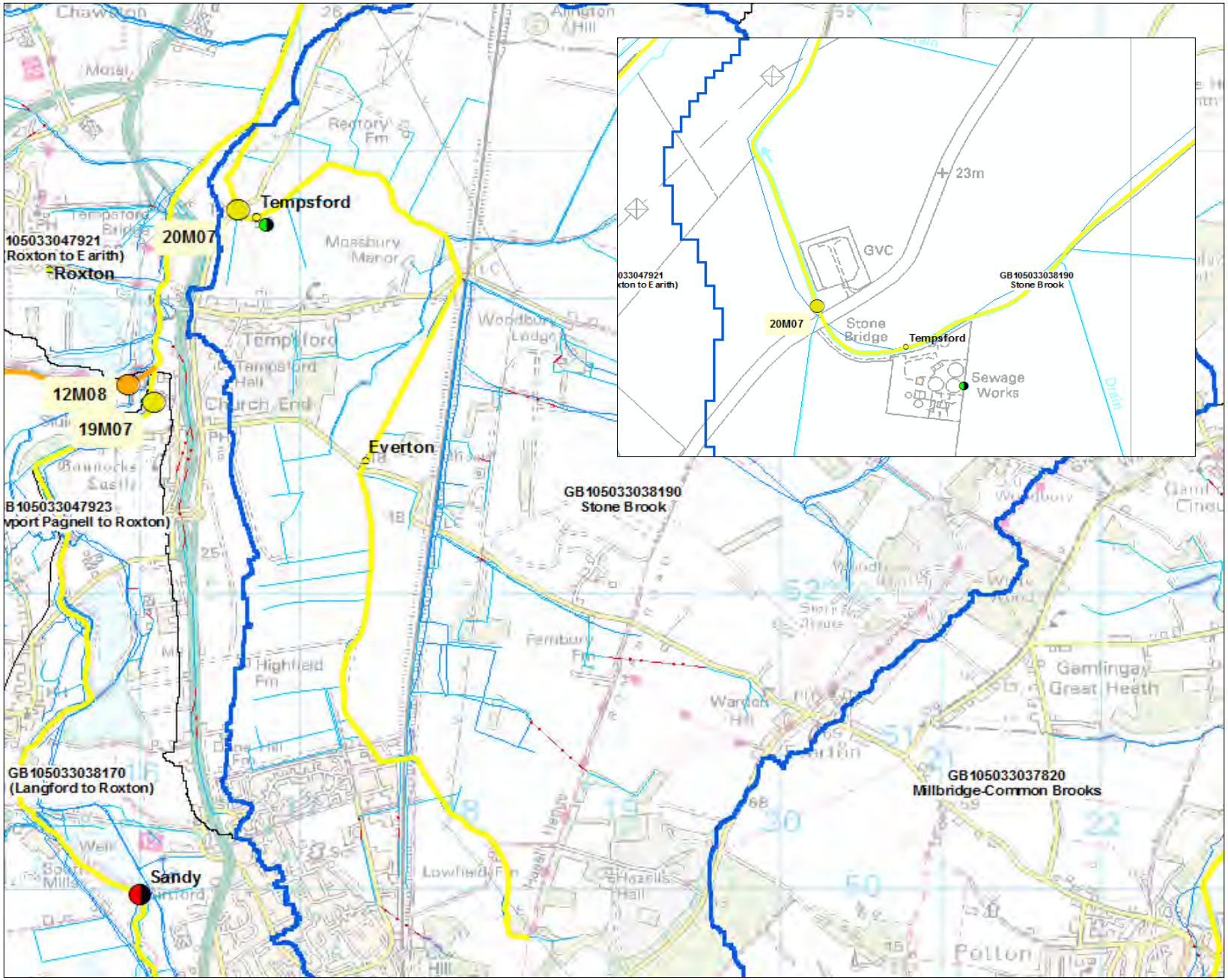
Discharge Quality Required - Post Growth DWF

Pre-AMP5 DWF (m3/day)		0	
Effluent quality required (95%ile or AA)	-		

WCS Conclusion:

No Deterioration Assessment:

Improve WFD status assessment:


Tempsford
20M07
105033047921
(Roxton to E arith)
Roxton
12M08
19M07
Everton
B105033047923
vport Pagnell to Roxton)
GB105033038190
Stone Brook
GB105033038170
(Langford to Roxton)
Sandy
GB105033037820
Millbridge-Common Brooks
23m
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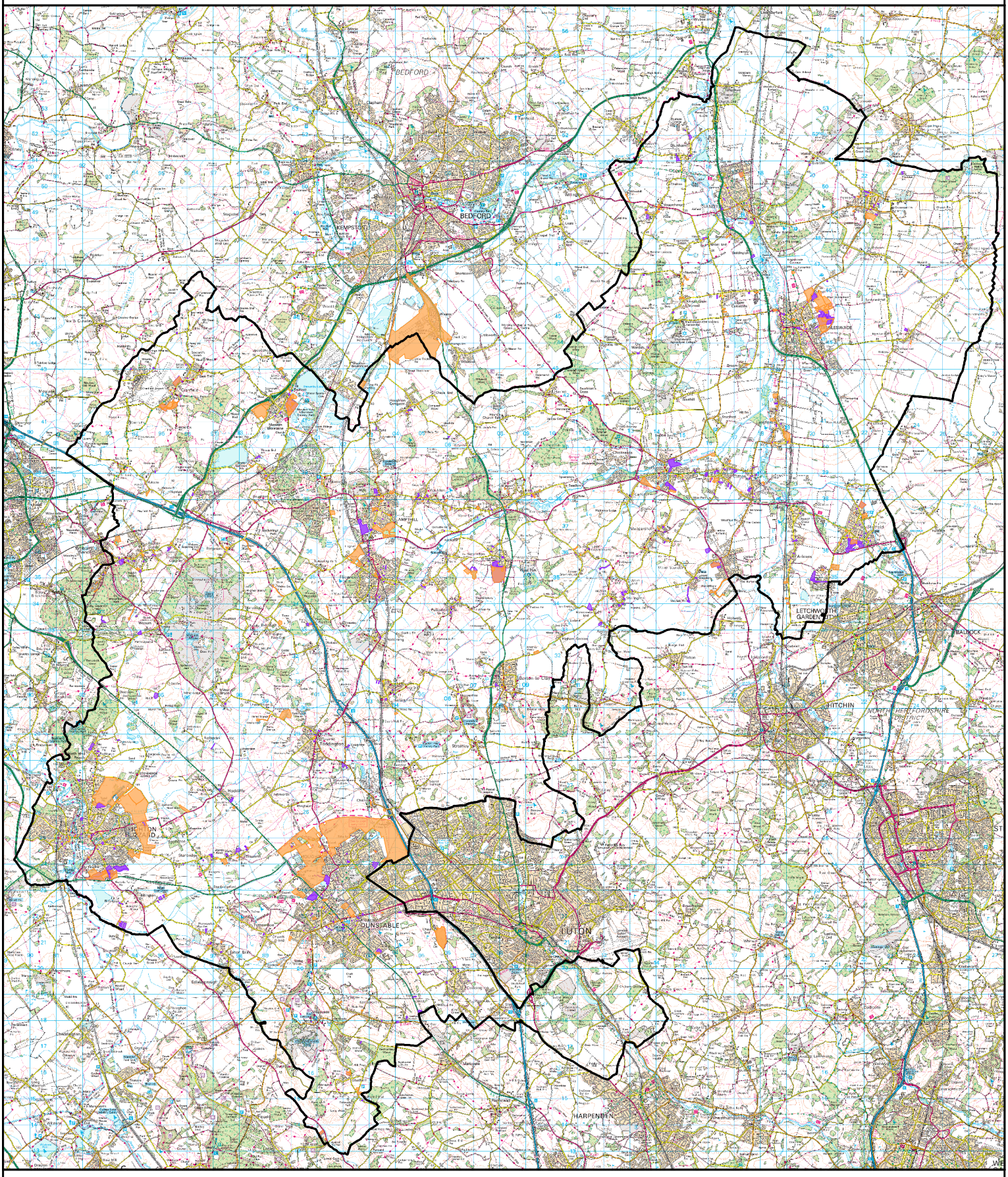
xton to E arith)
GB105033038190
Stone Brook
20M07
Stone
Bridge
Tempsford
Sewage
Works
Drain

B Appendix - Water Framework Directive Reasons for Not Achieving Good (RNAGs).

RNAG Unique ID	Year Created	Water Body ID	Water Body Name	Water Body Category	River Basin District	Country	EA Area	Classification Item	Pressure (level 1)	Pressure (level 2	Overall Pressure	Significant Water Management Issue	National Significant Water Management Issue	Certainty (SWMI)	Activity	Certainty (Activity)	Sector (level 1)	Sector (level 2)	Certainty (Sector)	2015 Classification Item Status (Cycle 2)	CBC
516224	2014	GB105033038040	Chicheley Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Macrophytes and Phytobenthos Combined	Nutrients	Phosphate	Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Poor	Chicheley Brook
516299	2014	GB105033037660	Running Waters-Steppingley	River	Anglian	England	Cambridgeshire and Bedfordshire	Macrophytes and Phytobenthos Combined	Nutrients	Phosphate	Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Moderate	Running Waters-Steppingley
516198	2014	GB105033038040	Chicheley Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Macrophytes and Phytobenthos Combined	Nutrients	Phosphate	Phosphate	Diffuse source	Pollution from rural areas	Confirmed	Arable field	Confirmed	Agriculture and rural land management	Agriculture - Arable	Confirmed	Poor	Chicheley Brook
516223	2014	GB105033038040	Chicheley Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Macrophytes and Phytobenthos Combined	Nutrients	Phosphate	Phosphate	Point source	Pollution from waste water	Confirmed	Industrial/trade discharge (non EPR)	Confirmed	Other		Confirmed	Poor	Chicheley Brook
516038	2014	GB105033037770	Henlow Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Dissolved oxygen			Dissolved oxygen (DO)	Flow	Changes to the natural flow and levels of water	Confirmed	Land drainage	Confirmed	Agriculture and rural land management		Confirmed	Moderate	Henlow Brook
516801	2014	GB105033037820	Millbridge and Potton Brooks	River	Anglian	England	Cambridgeshire and Bedfordshire	Macrophytes and Phytobenthos Combined	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Probable	Land drainage	Probable	Agriculture and rural land management	Agriculture - Arable	Probable	Moderate	Millbridge-Common Brooks
516040	2014	GB105033037770	Henlow Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Dissolved oxygen			Dissolved oxygen (DO)	Natural	Natural conditions	Confirmed	Natural conditions - low flows	Confirmed	No sector responsible		Not applicable	Moderate	Henlow Brook
517956	2015	GB105033038010	Harrowden Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Probable	Arable field	Probable	Agriculture and rural land management	Agriculture - Arable	Probable	Moderate	Harrowden Brook (Upper and Bedford Ouse)
517954	2015	GB105033038010	Harrowden Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Probable	Livestock field	Probable	Agriculture and rural land management	Agriculture - Livestock	Probable	Moderate	Harrowden Brook (Upper and Bedford Ouse)
517272	2013	GB105033037730	Pix Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Ammonia (Phys-Chem)			Ammonia	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Moderate	Pix Brook
517273	2013	GB105033037730	Pix Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Ammonia (Phys-Chem)			Ammonia	Point source	Pollution from waste water	Probable	Sewage discharge (intermittent)	Probable	Urban and transport	Urban	Probable	Moderate	Pix Brook
516798	2014	GB105033037820	Millbridge and Potton Brooks	River	Anglian	England	Cambridgeshire and Bedfordshire	Macrophytes and Phytobenthos Combined	Nutrients	Phosphate	Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Moderate	Millbridge-Common Brooks
512707	2015	GB105033030490	Whistle Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Probable	Mixed agricultural	Probable	Agriculture and rural land management		Probable	Poor	Whistle Brook
512708	2015	GB105033030490	Whistle Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Poor	Whistle Brook
512709	2015	GB105033030520	Ouzel (US Clipstone Brook)	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Moderate	Ouzel (US Clipstone Brook)
512710	2015	GB105033037500	Barton Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Poor	Barton Brook
520963	2014	GB105033037640	Flit	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Invasive non-native spe	Not applicable	Invasive non-native species	Invasive non-native species	Non-native invasive species	Confirmed	North american signal crayfish	Confirmed	No sector responsible		Not applicable	Moderate	Flit
520962	2014	GB105033037640	Flit	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Probable	Land drainage	Probable	Agriculture and rural land management	Agriculture - Arable	Probable	Moderate	Flit
520960	2014	GB105033037640	Flit	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Nutrients	Phosphate	Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Moderate	Flit
520942	2014	GB105033038190	Stone Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Dissolved oxygen	Not applicable	Dissolved oxygen (DO)	Point source	Pollution from waste water	Probable	Sewage discharge (continuous)	Probable	Water Industry	Waste water treatment	Probable	Poor	Stone Brook
520940	2014	GB105033038190	Stone Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Probable	Land drainage	Probable	Agriculture and rural land management	Agriculture - Arable	Probable	Poor	Stone Brook
520966	2014	GB105033037670	Chicksands Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Nutrients	Phosphate	Phosphate	Diffuse source	Pollution from rural areas	Probable	Arable field	Probable	Agriculture and rural land management	Agriculture - Arable	Probable	Poor	Chicksands Brook
520971	2014	GB105033037650	Flit tributary	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Sediment	Not applicable	Fine sediment	Natural	Natural conditions	Probable	Natural conditions - other	Probable	No sector responsible		Not applicable	Moderate	Flit tributary
520970	2014	GB105033037670	Chicksands Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Nutrients	Phosphate	Phosphate	Point source	Pollution from waste water	Probable	Sewage discharge (continuous)	Probable	Water Industry	Waste water treatment	Probable	Poor	Chicksands Brook
521302	2015	GB105033030500	Eaton Bray Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Macrophytes and Phytobenthos Combined	Other (not in list)	Not applicable	Other	Unknown (pending investigation)	Unknown (pending investigation)	Not applicable	Unknown (pending investigation)	Not applicable	Sector under investigation		Not applicable	Moderate	Eaton Bray Brook
521309	2015	GB105033038050	Elstow Brook (US Shortstown)	River	Anglian	England	Cambridgeshire and Bedfordshire	Macrophytes and Phytobenthos Combined	Other (not in list)	Not applicable	Other	Unknown (pending investigation)	Unknown (pending investigation)	Not applicable	Unknown (pending investigation)	Not applicable	Sector under investigation		Not applicable	Moderate	Elstow Brook (US Shortstown)
521308	2015	GB105033037930	Broughton Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Macrophytes and Phytobenthos Combined	Other (not in list)	Not applicable	Other	Unknown (pending investigation)	Unknown (pending investigation)	Not applicable	Unknown (pending investigation)	Not applicable	Sector under investigation		Not applicable	Poor	Broughton Brook (Upper and Bedford Ouse)
521307	2015	GB105033037740	Cat Ditch	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Other (not in list)	Not applicable	Other	Unknown (pending investigation)	Unknown (pending investigation)	Not applicable	Unknown (pending investigation)	Not applicable	Sector under investigation		Not applicable	Bad	Cat Ditch
521306	2015	GB105033037730	Pix Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Di(2-ethylhexyl)phthalate			Chemicals	Unknown (pending investigation)	Unknown (pending investigation)	Not applicable	Unknown (pending investigation)	Not applicable	Sector under investigation		Not applicable	Fail	Pix Brook
521305	2015	GB105033037670	Chicksands Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Dissolved oxygen			Dissolved oxygen (DO)	Unknown (pending investigation)	Unknown (pending investigation)	Not applicable	Unknown (pending investigation)	Not applicable	Sector under investigation		Not applicable	Bad	Chicksands Brook
521304	2015	GB105033037630	Clipstone Brook Tributary	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Other (not in list)	Not applicable	Other	Unknown (pending investigation)	Unknown (pending investigation)	Not applicable	Unknown (pending investigation)	Not applicable	Sector under investigation		Not applicable	Moderate	Clipstone Brook Tributary
518312	2014	GB105033038040	Chicheley Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Nutrients	Phosphate	Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Moderate	Chicheley Brook
518317	2015	GB105033037670	Chicksands Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Probable	Arable field	Probable	Agriculture and rural land management		Probable	Poor	Chicksands Brook
518313	2015	GB105033037670	Chicksands Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Probable	Sewage discharge (continuous)	Probable	Water Industry	Waste water treatment	Probable	Poor	Chicksands Brook
518316	2014	GB105033038040	Chicheley Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Nutrients	Phosphate	Phosphate	Point source	Pollution from waste water	Confirmed	Industrial/trade discharge (non EPR)	Confirmed	Other		Confirmed	Moderate	Chicheley Brook
518338	2015	GB105033037971	Ouzel US Caldecote Mill	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Probable	Livestock field	Probable	Agriculture and rural land management	Agriculture - Livestock	Probable	Moderate	Ouzel US Caldecote Mill
518336	2015	GB105033037971	Ouzel US Caldecote Mill	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Moderate	Ouzel US Caldecote Mill
518332	2014	GB105033037820	Millbridge and Potton Brooks	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Nutrients	Phosphate	Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Moderate	Millbridge-Common Brooks
518318	2014	GB105033038040	Chicheley Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Sediment	Not applicable	Fine sediment	Diffuse source	Pollution from rural areas	Confirmed	Arable field	Confirmed	Agriculture and rural land management	Agriculture - Arable	Confirmed	Moderate	Chicheley Brook
518311	2014	GB105033038040	Chicheley Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Nutrients	Phosphate	Phosphate	Diffuse source	Pollution from rural areas	Confirmed	Arable field	Confirmed	Agriculture and rural land management		Confirmed	Moderate	Chicheley Brook
483395	2014	GB105033037820	Millbridge and Potton Brooks	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Moderate	Millbridge-Common Brooks
483962	2014	GB105033037730	Pix Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from towns, cities and transport	Confirmed	Drainage - mixed	Confirmed	Urban and transport	Urban	Confirmed	Poor	Pix Brook
481742	2013	GB105033037930	Broughton Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Probable	Arable field	Probable	Agriculture and rural land management	Agriculture - Arable	Probable	Moderate	Broughton Brook (Upper and Bedford Ouse)
486464	2013	GB105033037750	Campton Brook (Hit)	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Invasive non-native spe	Not applicable	Invasive non-native species	Invasive non-native species	Non-native invasive species	Confirmed	North american signal crayfish	Confirmed	No sector responsible		Not applicable	Moderate	Campton Brook
481741	2013	GB105033037930	Broughton Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Probable	Mixed agricultural	Probable	Agriculture and rural land management	Agriculture - Livestock	Probable	Moderate	Broughton Brook (Upper and Bedford Ouse)
481740	2013	GB105033037930	Broughton Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Probable	Unsewered domestic sewage	Probable	Domestic General Public		Probable	Moderate	Broughton Brook (Upper and Bedford Ouse)
482231	2013	GB105033037750	Campton Brook (Hit)	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Probable	Land drainage	Probable	Agriculture and rural land management	Agriculture - Arable	Probable	Moderate	Campton Brook
486446	2014	GB105033037640	Flit	River	Anglian	England	Cambridgeshire and Bedfordshire	Fish	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Confirmed	Barriers to fish migration	Confirmed	Agriculture and rural land management		Probable	Poor	Flit
486428	2014	GB105033030520	Ouzel (US Clipstone Brook)	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Invasive non-native spe	Not applicable	Invasive non-native species	Invasive non-native species	Non-native invasive species	Confirmed	North american signal crayfish	Confirmed	No sector responsible		Not applicable	Moderate	Ouzel (US Clipstone Brook)
486433	2014	GB105033030530	Ouzel Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Poor	Ouzel Brook
486448	2014	GB105033037640	Flit	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Poor	Flit
486450	2014	GB105033037660	Running Waters-Steppingley	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Dissolved oxygen	Not applicable	Dissolved oxygen (DO)	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Moderate	Running Waters-Steppingley
486451	2014	GB105033037660	Running Waters-Steppingley	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Nutrients	Phosphate	Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Moderate	Running Waters-Steppingley
486452	2014	GB105033037660	Running Waters-Steppingley	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Poor	Running Waters-Steppingley
486458	2014	GB105033037700	Hiz (DS Hitchin)	River	Anglian	England	Cambridgeshire and Bedfordshire	Fish	Invasive non-native spe	Not applicable	Invasive non-native species	Invasive non-native species	Non-native invasive species	Confirmed	North american signal crayfish	Confirmed	No sector responsible		Not applicable	Moderate	Hiz (DS Hitchin)
486460	2014	GB105033037700	Hiz (DS Hitchin)	River	Anglian	England	Cambridgeshire and Bedfordshire	Fish	Sediment	Not applicable	Fine sediment	Diffuse source	Pollution from towns, cities and transport	Confirmed	Drainage - mixed	Confirmed	Urban and transport	Urban	Confirmed	Moderate	Hiz (DS Hitchin)
478999	2013	GB105033038100	Rhee (US Wendy)	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Land drainage		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Agriculture and rural land management		Confirmed	Moderate or less	Rhee (US Wendy)
479004	2013	GB105033038170	Ivel (DS Langford to Roxton)	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Flood protection		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Local and Central Government		Confirmed	Moderate or less	Ivel (Langford to Roxton)
479005	2013	GB105033038170	Ivel (DS Langford to Roxton)	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Land drainage		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Agriculture and rural land management		Confirmed	Moderate or less	Ivel (Langford to Roxton)
478952	2013	GB105033037700	Hiz (DS Hitchin)	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Flood protection		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Local and Central Government		Confirmed	Moderate or less	Hiz (DS Hitchin)
478953	2013	GB105033037700	Hiz (DS Hitchin)	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Land drainage		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Agriculture and rural land management		Confirmed	Moderate or less	Hiz (DS Hitchin)
478982	2013	GB105033037971	Ouzel US Caldecote Mill	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Flood protection		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Local and Central Government		Confirmed	Moderate or less	Ouzel US Caldecote Mill
478983	2013	GB105033037971	Ouzel US Caldecote Mill	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Land drainage		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Agriculture and rural land management		Confirmed	Moderate or less	Ouzel US Caldecote Mill
478984	2013	GB105033037971	Ouzel US Caldecote Mill	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Urbanisation		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Urban and transport		Confirmed	Moderate or less	Ouzel US Caldecote Mill
478918	2013	GB105033030520	Ouzel (US Clipstone Brook)	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Land drainage		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Agriculture and rural land management		Confirmed	Moderate or less	Ouzel (US Clipstone Brook)
479142	2013	GB105033047921	Ouse (Roxton to Earith)	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Recreation		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Recreation	Recreation	Confirmed	Moderate or less	Ouse (Roxton to Earith)
479143	2013	GB105033047921	Ouse (Roxton to Earith)	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Flood protection		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Local and Central Government		Confirmed	Moderate or less	Ouse (Roxton to Earith)
479144	2013	GB105033047923	Ouse (Newport Pagnell to Roxton)	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Recreation		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Recreation	Recreation	Confirmed	Moderate or less	Ouse (Newport Pagnell to Roxton)
479145	2013	GB105033047923	Ouse (Newport Pagnell to Roxton)	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Flood protection		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Local and Central Government		Confirmed	Moderate or less	Ouse (Newport Pagnell to Roxton)
479146	2013	GB105033047923	Ouse (Newport Pagnell to Roxton)	River	Anglian	England	Cambridgeshire and Bedfordshire	Mitigation Measures Assessment	Urbanisation		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Urban and transport		Confirmed	Moderate or less	Ouse (Newport Pagnell to Roxton)
486466	2014	GB105033037750	Campton Brook (Hit)	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Poor	Campton Brook
486461	2014	GB105033037730	Pix Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Poor	Pix Brook
510498	2014	GB105033030490	Whistle Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Invasive non-native spe	Not applicable	Invasive non-native species	Invasive non-native species	Non-native invasive species	Confirmed	North american signal crayfish	Confirmed	No sector responsible		Not applicable	Moderate	Whistle Brook
509032	2014	GB105033037710	Stondon Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Dissolved oxygen			Dissolved oxygen (DO)	Natural	Natural conditions	Probable	Natural conditions - low flows	Probable	No sector responsible		Not applicable	Bad	Stondon Brook
510497	2014	GB105033030490	Whistle Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Confirmed	Land drainage	Confirmed	Agriculture and rural land management	Agriculture - Arable	Confirmed	Moderate	Whistle Brook
510018	2014	GB105033038190	Stone Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Dissolved oxygen			Dissolved oxygen (DO)	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Bad	Stone Brook
510019	2014	GB105033038190	Stone Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Dissolved oxygen			Dissolved oxygen (DO)	Natural	Natural conditions	Probable	Natural conditions - low flows	Probable	No sector responsible		Not applicable	Bad	Stone Brook
510027	2014	GB105033038190	Stone Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Ammonia (Phys-Chem)			Ammonia	Point source	Pollution from waste water	Probable	Sewage discharge (continuous)	Probable	Water Industry	Waste water treatment	Probable	Poor	Stone Brook
510031	2014	GB105033038190	Stone Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Moderate	Stone Brook
510032	2014	GB105033038190	Stone Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Confirmed	Arable field	Confirmed	Agriculture and rural land management	Agriculture - Arable	Confirmed	Moderate	Stone Brook
486698	2014	GB105033047921	Ouse (Roxton to Earith)	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Confirmed	Livestock field	Confirmed	Agriculture and rural land management	Agriculture - Livestock	Confirmed	Moderate	Ouse (Roxton to Earith)
486697	2014	GB105033047921	Ouse (Roxton to Earith)	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Confirmed	Arable field	Confirmed	Agriculture and rural land management	Agriculture - Arable	Confirmed	Moderate	Ouse (Roxton to Earith)
486699	2014	GB105033047923	Ouse (Newport Pagnell to Roxton)	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Poor	Ouse (Newport Pagnell to Roxton)
486700	2014	GB105033047923	Ouse (Newport Pagnell to Roxton)	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Confirmed	Arable field	Confirmed	Agriculture and rural land management		Confirmed	Poor	Ouse (Newport Pagnell to Roxton)
486701	2014	GB105033047923	Ouse (Newport Pagnell to Roxton)	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Confirmed	Livestock field	Confirmed	Agriculture and rural land management	Agriculture - Livestock	Confirmed	Poor	Ouse (Newport Pagnell to Roxton)
486696	2014	GB105033047921	Ouse (Roxton to Earith)	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry	Waste water treatment	Confirmed	Moderate	Ouse (Roxton to Earith)
486503	2014	GB105033038040	Chicheley Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Industrial/trade discharge (non EPR)	Confirmed	Other		Confirmed	Bad	Chicheley Brook
486504	2014	GB105033038040	Chicheley Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Bad	Chicheley Brook
486511	2014	GB105033038100	Rhee (US Wendy)	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Poor	Rhee (US Wendy)
486512	2014	GB105033038170	Ivel (DS Langford to Roxton)	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Moderate	Ivel (Langford to Roxton)
486468	2014	GB105033037770	Henlow Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Nutrients	Phosphate	Phosphate	Point source	Pollution from waste water	Probable	Sewage discharge (continuous)	Probable	Water Industry		Probable	Moderate	Henlow Brook
486470	2014	GB105033037770	Henlow Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Poor	Henlow Brook
486474	2014	GB105033037790	Flit and Ivel Navigation d/s of Shefford	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Poor	Ivel Navigation
486502	2014	GB105033038040	Chicheley Brook	River	Anglian	England	Cambridgeshire and Bedfordshire	Phosphate			Phosphate	Diffuse source	Pollution from rural areas	Confirmed	Arable field	Confirmed	Agriculture and rural land management	Agriculture - Arable	Confirmed	Bad	Chicheley Brook
486485	2014	GB105033037820	Millbridge and Potton Brooks	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Ammonia	Not applicable	Ammonia	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Moderate	Millbridge-Common Brooks
486482	2014	GB105033037820	Millbridge and Potton Brooks	River	Anglian	England	Cambridgeshire and Bedfordshire	Invertebrates	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Confirmed	Land drainage - operational management	Probable	Other		Probable	Moderate	Millbridge-Common Brooks
516960	2015	GB106038033391	Lee (from Luton to Luton Hoo Lakes)	River	Thames	England	Hertfordshire and North London	Fish	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Confirmed	Urbanisation - urban development	Confirmed	Urban and transport		Confirmed	Bad	Lee (from Luton to Luton Hoo Lakes)
516963	2015	GB106039029920	Ver	River	Thames	England	Hertfordshire and North London	Macrophytes and Phytobenthos Combined	Hydrology	Not applicable	Abstraction and flow	Flow	Changes to the natural flow and levels of water	Probable	Groundwater abstraction	Probable	Water Industry	Water supply	Probable	Moderate	Ver
516972	2015	GB106039029920	Ver	River	Thames	England	Hertfordshire and North London	Macrophytes and Phytobenthos Combined	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Probable	Impoundments	Probable	Other		Probable	Moderate	Ver
516973	2015	GB106039029920	Ver	River	Thames	England	Hertfordshire and North London	Macrophytes and Phytobenthos Combined	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Probable	Impoundments	Probable	Other		Probable	Moderate	Ver
516975	2015	GB106039029920	Ver	River	Thames	England	Hertfordshire and North London	Macrophytes and Phytobenthos Combined	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Probable	Urbanisation - urban development	Probable	Urban and transport	Urban	Probable	Moderate	Ver
517580	2013	GB106039029920	Ver	River	Thames	England	Hertfordshire and North London	Morphology			Physical modification	Physical modification	Physical modifications	Probable	Urbanisation - urban development	Probable	Urban and transport	Urban	Probable	Does Not Support Good	Ver
517623	2013	GB106039029920	Ver	River	Thames	England	Hertfordshire and North London	Morphology			Physical modification	Physical modification	Physical modifications	Probable	Impoundments	Probable	Other		Probable	Does Not Support Good	Ver
517624	2013	GB106039029920	Ver	River	Thames	England	Hertfordshire and North London	Morphology			Physical modification	Physical modification	Physical modifications	Probable	Impoundments	Probable	Other		Probable	Does Not Support Good	Ver
514650	2015	GB106038033391	Lee (from Luton to Luton Hoo Lakes)	River	Thames	England	Hertfordshire and North London	Fish	Nutrients	Phosphate	Phosphate	Diffuse source	Pollution from towns, cities and transport	Probable	Sewage discharge (diffuse)	Probable	Urban and transport	Urban	Probable	Bad	Lee (from Luton to Luton Hoo Lakes)
514655	2014	GB106039029900	Gade (Upper stretch Great Gaddesden	River	Thames	England	Hertfordshire and North London	Macrophytes and Phytobenthos Combined	Nutrients	Phosphate	Phosphate	Diffuse source	Pollution from towns, cities and transport	Probable	Sewage discharge (diffuse)	Probable	Urban and transport		Probable	Bad	Gade (Upper stretch Great Gaddesden to confluence with Bulbourne / GUC)
514648	2015	GB106038033391	Lee (from Luton to Luton Hoo Lakes)	River	Thames	England	Hertfordshire and North London	Fish	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Probable	Flood protection - structures	Probable	Urban and transport	Other (not in list)	Probable	Bad	Lee (from Luton to Luton Hoo Lakes)
479348	2013	GB106038033391	Lee (from Luton to Luton Hoo Lakes)	River	Thames	England	Hertfordshire and North London	Mitigation Measures Assessment	Flood protection		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Local and Central Government		Confirmed	Moderate or less	Lee (from Luton to Luton Hoo Lakes)
479349	2013	GB106038033391	Lee (from Luton to Luton Hoo Lakes)	River	Thames	England	Hertfordshire and North London	Mitigation Measures Assessment	Urbanisation		Physical modification	Physical modification	Physical modifications	Confirmed	Other (not in list)	Confirmed	Urban and transport		Confirmed	Moderate or less	Lee (from Luton to Luton Hoo Lakes)
487151	2014	GB106038033391	Lee (from Luton to Luton Hoo Lakes)	River	Thames	England	Hertfordshire and North London	Dissolved oxygen			Dissolved oxygen (DO)	Point source	Pollution from waste water	Probable	Sewage discharge (intermittent)	Probable	Water Industry		Probable	Poor	Lee (from Luton to Luton Hoo Lakes)
487152	2014	GB106038033391	Lee (from Luton to Luton Hoo Lakes)	River	Thames	England	Hertfordshire and North London	Hydrological Regime			Abstraction and flow	Flow	Changes to the natural flow and levels of water	Confirmed	Groundwater abstraction	Confirmed	Water Industry	Water supply	Confirmed	Does Not Support Good	Lee (from Luton to Luton Hoo Lakes)
487157	2014	GB106038033392	Lee (from Luton Hoo Lakes to Hertford)	River	Thames	England	Hertfordshire and North London	Phosphate			Phosphate	Point source	Pollution from waste water	Confirmed	Sewage discharge (continuous)	Confirmed	Water Industry		Confirmed	Poor	Lee (from Luton Hoo Lakes to Hertford)
487655	2014	GB106039029920	Ver	River	Thames	England	Hertfordshire and North London	Hydrological Regime			Abstraction and flow	Flow	Changes to the natural flow and levels of water	Confirmed	Groundwater abstraction	Confirmed	Water Industry	Water supply	Confirmed	Does Not Support Good	Ver
507199	2014	GB106039029900	Gade (Upper stretch Great Gaddesden	River	Thames	England	Hertfordshire and North London	Hydrological Regime			Abstraction and flow	Flow	Changes to the natural flow and levels of water	Confirmed	Groundwater abstraction	Confirmed	Water Industry	Water supply	Confirmed	Does Not Support Good	Gade (Upper stretch Great Gaddesden to confluence with Bulbourne / GUC)
507200	2014	GB106039029900	Gade (Upper stretch Great Gaddesden	River	Thames	England	Hertfordshire and North London	Macrophytes and Phytobenthos Combined	Hydrology	Not applicable	Abstraction and flow	Flow	Changes to the natural flow and levels of water	Confirmed	Groundwater abstraction	Confirmed	Water Industry	Water supply	Confirmed	Bad	Gade (Upper stretch Great Gaddesden to confluence with Bulbourne / GUC)
507202	2014	GB106039029900	Gade (Upper stretch Great Gaddesden	River	Thames	England	Hertfordshire and North London	Macrophytes and Phytobenthos Combined	Hydrology	Not applicable	Abstraction and flow	Flow	Changes to the natural flow and levels of water	Confirmed	Surface water abstraction	Confirmed	Industry		Confirmed	Bad	Gade (Upper stretch Great Gaddesden to confluence with Bulbourne / GUC)
507203	2014	GB106039029900	Gade (Upper stretch Great Gaddesden	River	Thames	England	Hertfordshire and North London	Macrophytes and Phytobenthos Combined	Hydrology	Not applicable	Abstraction and flow	Flow	Changes to the natural flow and levels of water	Confirmed	Impoundment - no water storage	Confirmed	Local and Central Government	Environment, Farming, Rural	Confirmed	Bad	Gade (Upper stretch Great Gaddesden to confluence with Bulbourne / GUC)
507204	2014	GB106039029900	Gade (Upper stretch Great Gaddesden	River	Thames	England	Hertfordshire and North London	Macrophytes and Phytobenthos Combined	Sediment	Not applicable	Fine sediment	Flow	Changes to the natural flow and levels of water	Confirmed	Impoundment - no water storage	Confirmed	Local and Central Government	Environment, Farming, Rural	Confirmed	Bad	Gade (Upper stretch Great Gaddesden to confluence with Bulbourne / GUC)
507205	2014	GB106039029900	Gade (Upper stretch Great Gaddesden	River	Thames	England	Hertfordshire and North London	Macrophytes and Phytobenthos Combined	Morphology	Not applicable	Physical modification	Physical modification	Physical modifications	Confirmed	Urbanisation - urban development	Confirmed	Urban and transport	Urban	Confirmed	Bad	Gade (Upper stretch Great Gaddesden to confluence with Bulbourne / GUC)
507206	2014	GB106039029900	Gade (Upper stretch Great Gaddesden	River	Thames	England	Hertfordshire and North London	Macrophytes and Phytobenthos Combined	Sediment	Not applicable	Fine sediment	Physical modification	Physical modifications	Confirmed	Urbanisation - urban development	Confirmed	Urban and transport	Urban	Confirmed	Bad	Gade (Upper stretch Great Gaddesden to confluence with Bulbourne / GUC)
492449	2014	GB106038033392	Lee (from Luton Hoo Lakes to Hertford)	River	Thames	England	Hertfordshire and North London	Phosphate			Phosphate	Point source	Pollution from waste water	Probable	Sewage discharge (intermittent)	Probable	Urban and transport	Other (not in list)	Probable	Poor	Lee (from Luton Hoo Lakes to Hertford)

C Appendix - Completions and Commitments

Central Bedfordshire Housing Completions & Commitments



Housing Completions 2011-15

Residential Planning Permissions

N
W
E
S

Date: 10 January 2018

Not to scale

Central Bedfordshire

Offices at
Coleshill
Doncaster
Dublin
Edinburgh
Exeter
Glasgow
Haywards Heath
Isle of Man
Limerick
Newcastle upon Tyne
Newport
Peterborough
Saltaire
Skipton
Tadcaster
Thirsk
Wallingford
Warrington

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