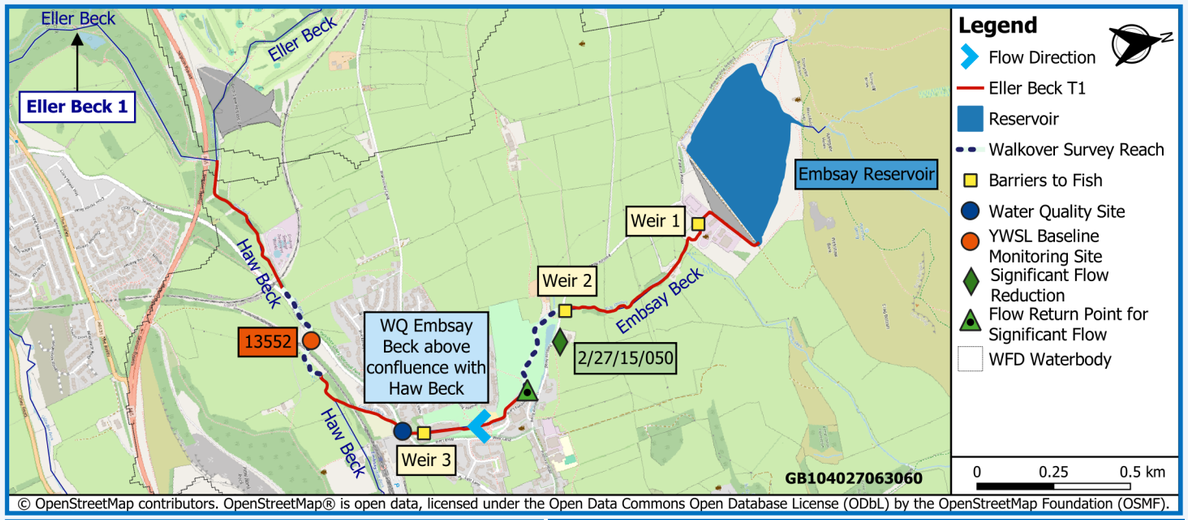
Reach Setting

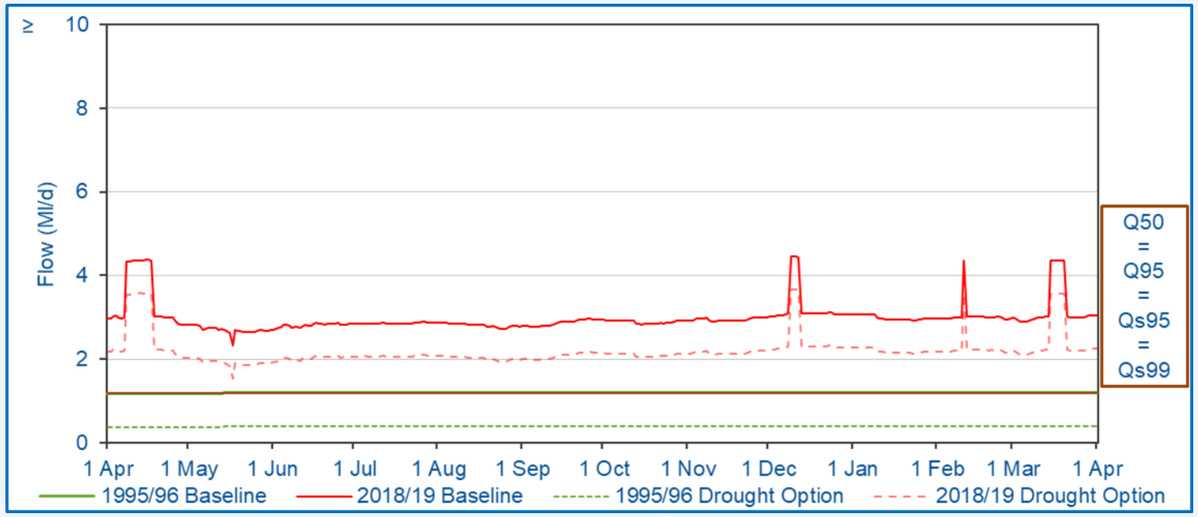


Reach Setting Information:

The superficial geology of this reach is composed predominantly of glacial till. Soil types along the reach are composed predominantly of slowly permeable, seasonally wet acid loamy and clayey soils. Surrounding land use is predominantly improved grassland, suburban/urban land use between 0.9km and 1.5km downstream as the channel flows through Embsay and improved grassland to the end of the reach.

	Supplementary Information
Catchment Area at Assessment Point	2.8km^2
Mean Slope Gradient	1.12°
Length of Reach	2.9km
Additional Catchment Area	8.1km^2
Upstream Reach	N/A
Downstream Reach	Eller Beck 1

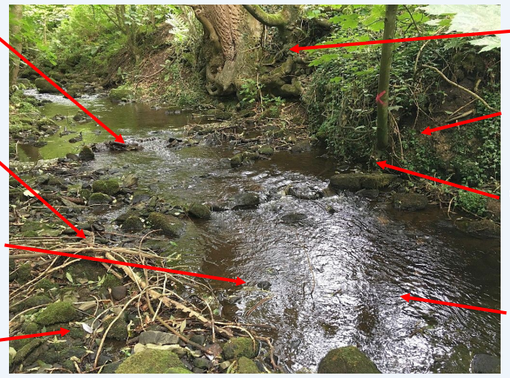
River Flow Regime



-	Reference Conditions (Ml/d)	Drought Plan Conditions (Ml/d)	% Reduction	Impact
$Q_{s}95$	1.19	0.39	67	Summer Major
$Q_{s}99$	1.19	0.39	67	
Q95	1.19	0.39	67	Winter Major
Q50	1.19	0.39	67	

Significant Flow Additions/Reductions	Flow Rate (Ml/d)	Abstraction / Discharge
Embsay Beck –at Embsay Tannery –Skipton 2/27/15/050	0.182	Abstraction

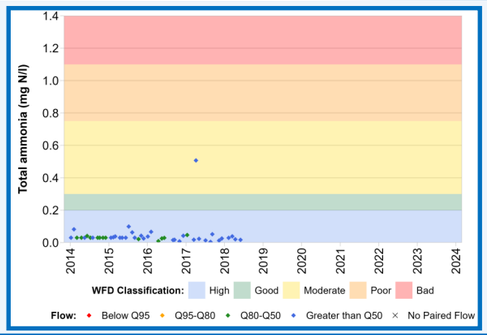
River Habitats

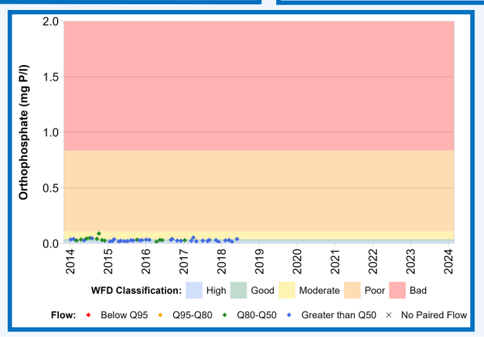


River Water Quality

There are no significant water quality pressures associated with this reach

One water quality monitoring location is present in Embsay Beck Above Confluence with Haw Bk (NE49400334). The average pH between 2014-2023 was 8.02 with a maximum temperature of 16.3°C for the same period.





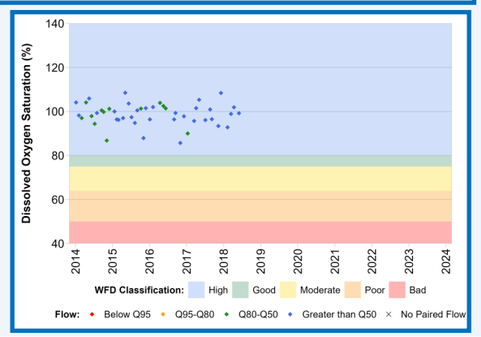


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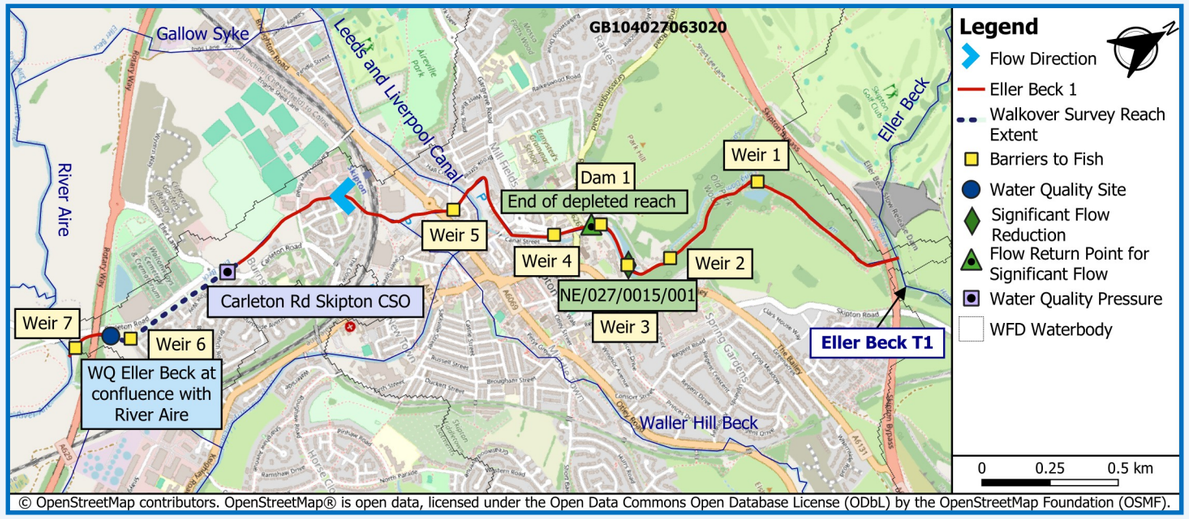
Figure A4.1

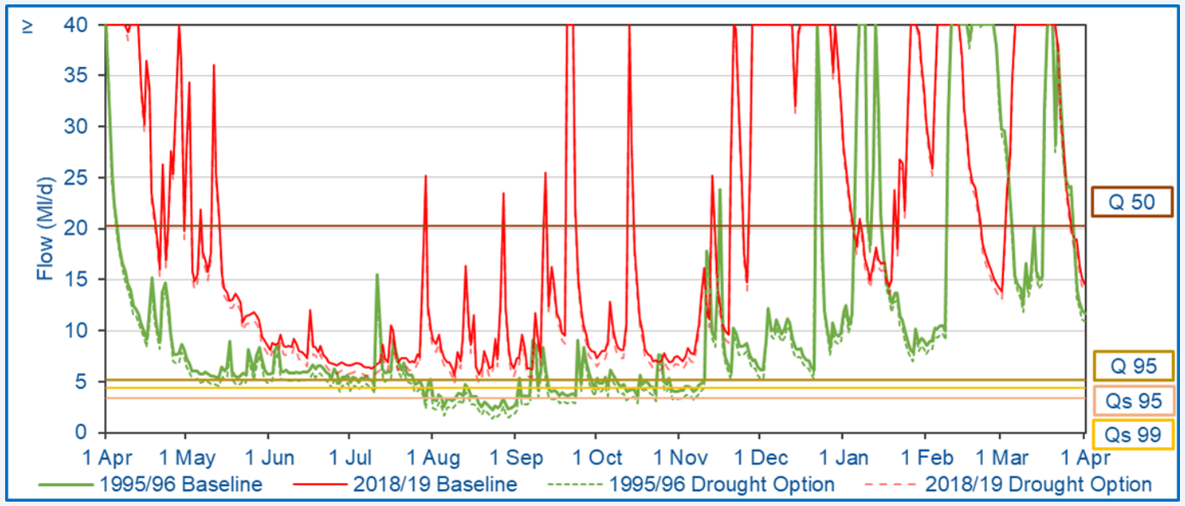
Eller Beck T1:

Physical Environment Information

Reach Setting



River Flow Regime



Reach Setting Information:

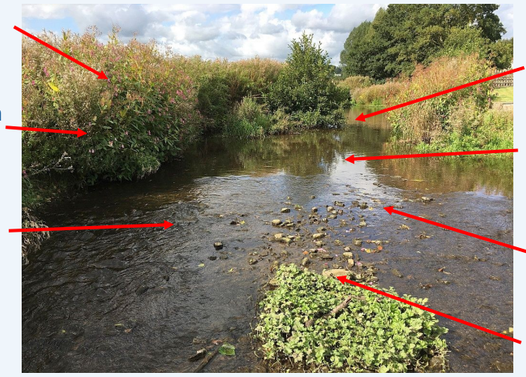
The superficial geology is composed of alluvium along with glacial tills surrounding the reach. Extensive river terrace deposits and alluvium are located around the confluence with the River Aire. Soil types along the reach are composed predominantly of slowly permeable, seasonally wet acid loamy and clayey soils with some loamy and clayey floodplain soils around the confluence with the River Aire .Suburban/urban land is dominant as the channel flows through Skipton (1.2-2km downstream)

	Supplementary Information
Catchment Area at Assessment Point	23.5km^2
Mean Slope Gradient	0.6^o
Length of Reach	3.9km
Additional Catchment Area	9.8km^2
Upstream Reach	Eller Beck T1
Downstream Reach	N/A

-	Reference Conditions (Ml/d)	Drought Plan Conditions (Ml/d)	% Reduction	Impact
Q_s95	4.3	3.5	18.3	Summer Moderate
Q_s99	3.3	2.5	23.8	
Q95	5.2	4.4	15.3	Winter Minor
Q50	20.3	19.5	3.9	

Significant Flow Additions/Reductions	Flow Rate (Ml/d)	Abstraction / Discharge
Skipton Corn Mill, Skipton NE/027/0015/001	38.88	Abstraction (Flow returned ~200m downstream)

River Habitats



River Water Quality

Significant Water Quality Pressures	Permit Conditions
Carleton Road Skipton CSO YWUCD2/103 1	Intermittent discharge

Two water quality monitoring points are present in Eller Beck 1. For this assessment the second point in the reach, Eller Beck at Confluence with River Aire (NE49400308), was used due having a greater sampling period. The average pH between 2014-2023 was 8.2 with a maximum temperature of 17.6˚C for the same period.

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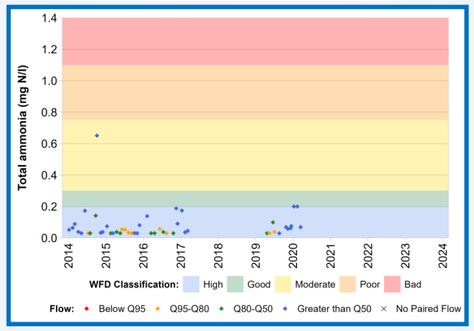
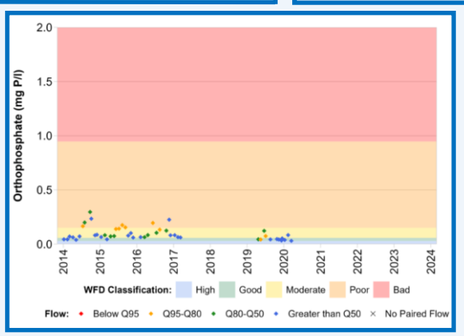
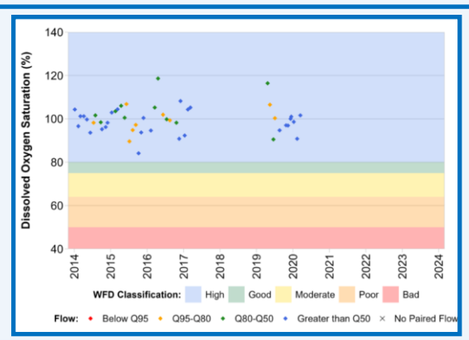
Figure A4.2

Eller Beck 1

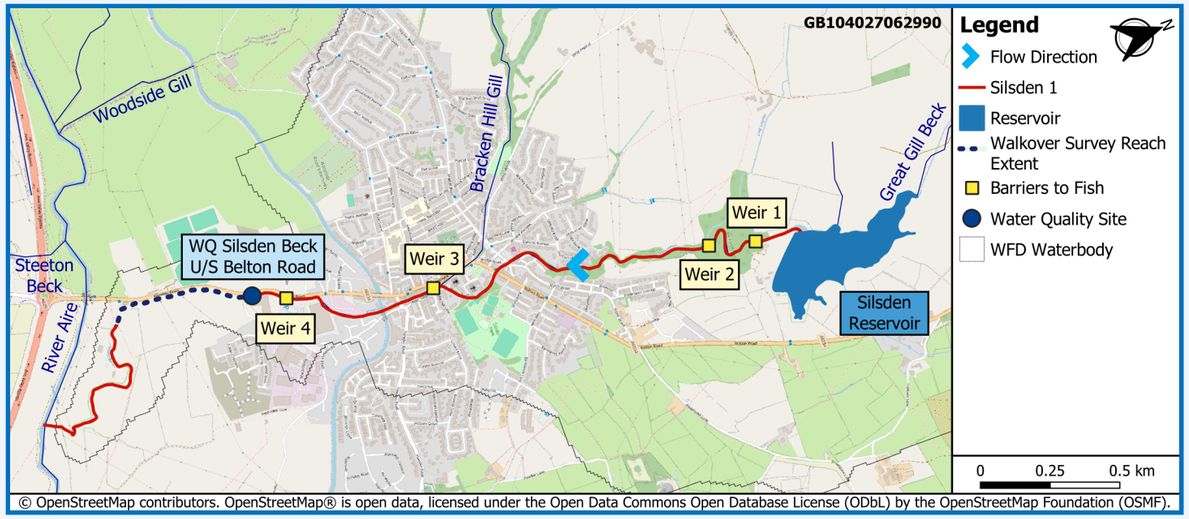
Physical Environment Information



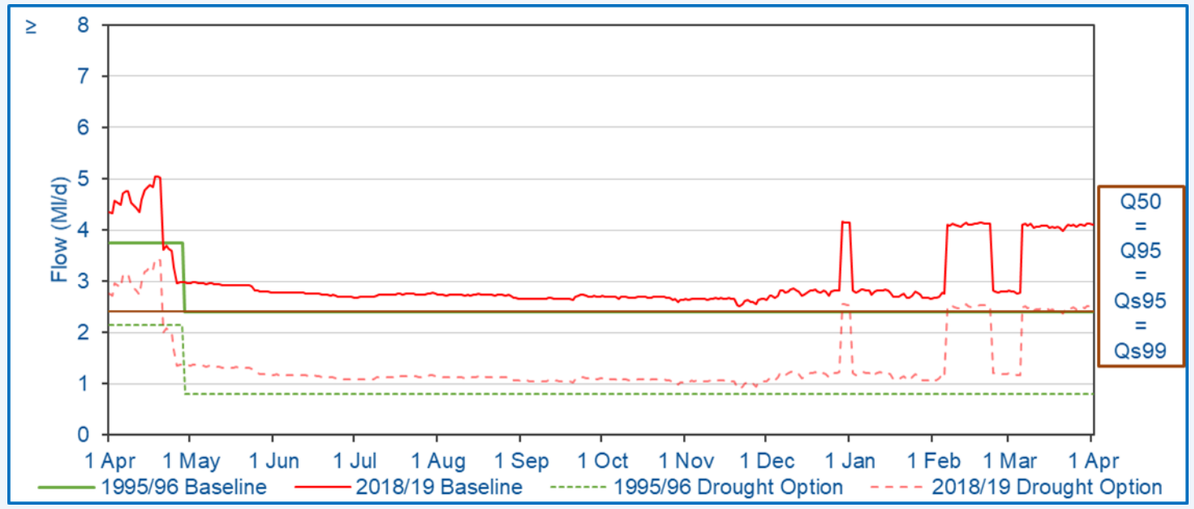




Reach Setting



River Flow Regime



Reach Setting Information:

The superficial geology is predominantly alluvium with extensive alluvial fan deposits and alluvium at the end of the reach around the confluence with the River Aire. Soil types in the reach are composed predominantly of slowly permeable, seasonally wet acid loamy and clayey soils with some loamy and clayey floodplain soils around the confluence with the River Aire. Suburban/urban land use is observed between 0.5km and 2.0km downstream as the channel passes through Silsden.

	Supplementary Information
Catchment Area at Assessment Point	7.6km^2
Mean Slope Gradient	1.5^o
Length of Reach	3.0km
Additional Catchment Area	6.0km^2
Upstream Reach	N/A
Downstream Reach	N/A

-	Reference Conditions (Ml/d)	Drought Plan Conditions (Ml/d)	% Reduction	Impact
Q_s95	2.41	0.80	67	Summer Major
Q_s99	2.41	0.80	67	
Q95	2.41	0.80	67	Winter Major
Q50	2.41	0.80	67	

There are no significant flow additions/ reductions associated with this reach

River Habitats

River Water Quality

There are no significant water quality pressures associated with this reach

Two water quality monitoring sites are present in Silsden Beck 1. For this assessment the most upstream site in the reach, Silsden Beck U/S Belton Road (NE49400835), was used due to its position in the reach and its data quality. The average pH between 2014-2023 was 8.2 with a maximum temperature of 18.3°C for the same period.

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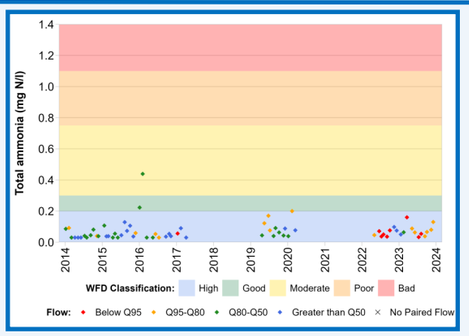
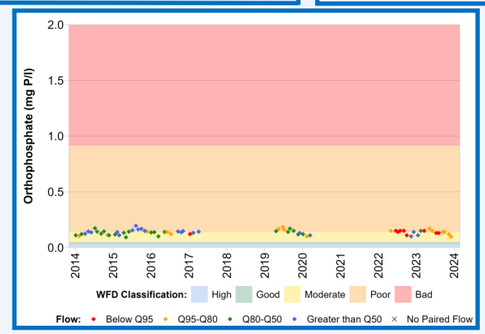
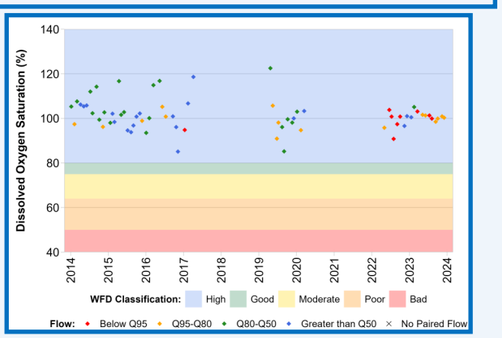
Figure A4.3

Silsden Beck 1

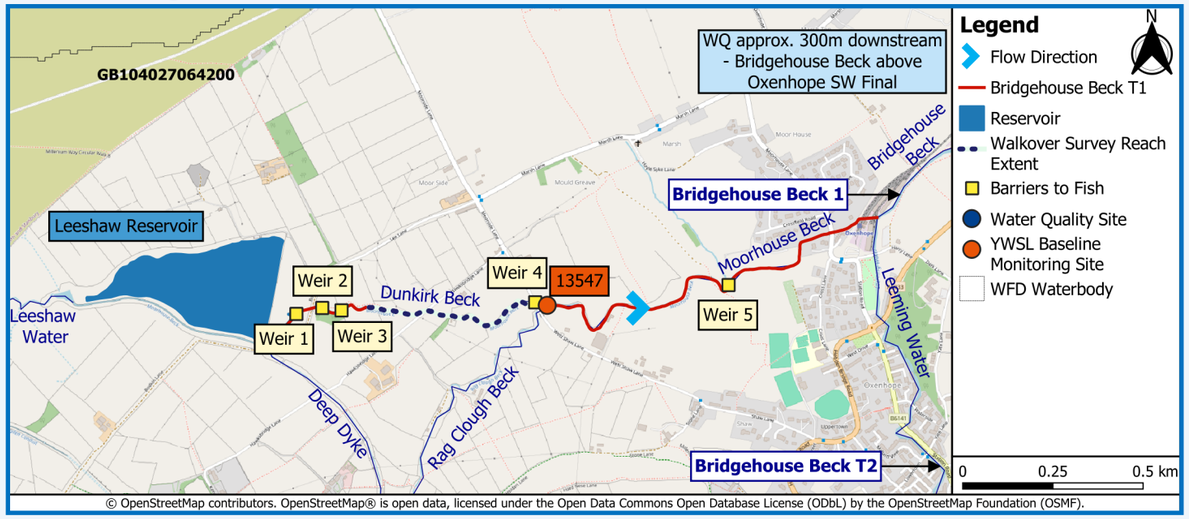
Physical Environment Information



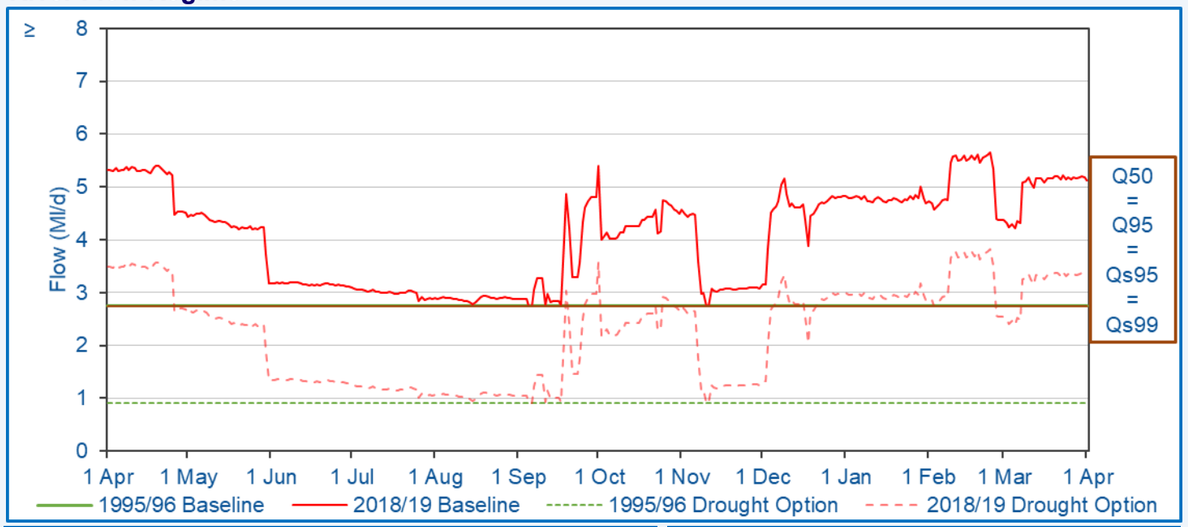




Reach Setting



River Flow Regime



Reach Setting Information:

The superficial geology is composed of alluvium along the channel path and surrounded by glacial till. Soil types along the reach are composed predominantly of freely draining, slightly acid loamy soils. There is some suburban/urban land usage as the reach passes through Oxenhope.

	Supplementary Information
Catchment Area at Assessment Point	3.7km^2
Mean Slope Gradient	1.1°
Length of Reach	2.0km
Additional Catchment Area	2.7km^2
Upstream Reach	N/A
Downstream Reach	Bridgehouse Beck 1

-	Reference Conditions (Ml/d)	Drought Plan Conditions (Ml/d)	% Reduction	Impact
$Q_{s}95$	2.75	0.91	67	Summer Major
$Q_{s}99$	2.75	0.91	67	
Q95	2.75	0.91	67	Winter Major
Q50	2.75	0.91	67	

There are no significant flow additions/ reductions associated with this reach

River Habitats

River Water Quality

There are no significant water quality pressures associated with this reach

There are no water quality monitoring sites in Bridgehouse Beck T1. As such the most upstream monitoring site in the downstream reach (Bridgehouse Beck 1), Bridgehouse Beck Above Oxenhope Sw Final (NE49400075) has been used. The average pH between 2014-2023 was 7.8 with a maximum temperature of 15.4°C for the same period.

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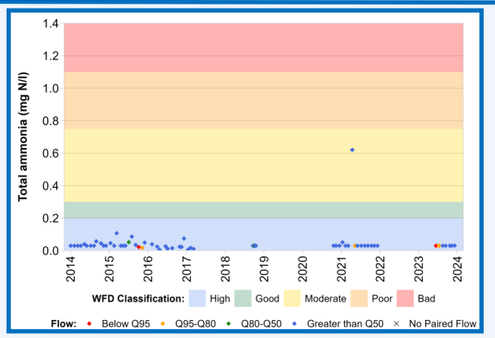
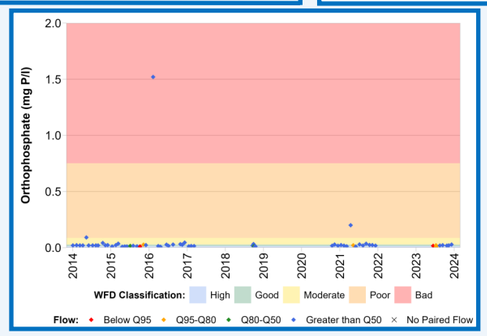
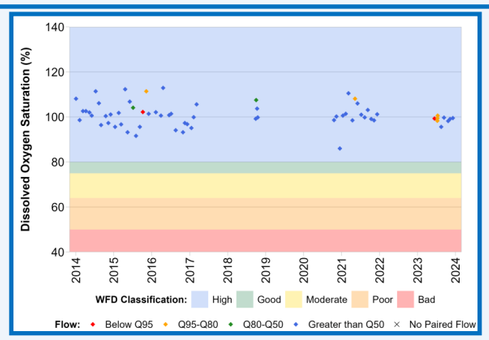
Figure A4.5

Bridgehouse Beck T1

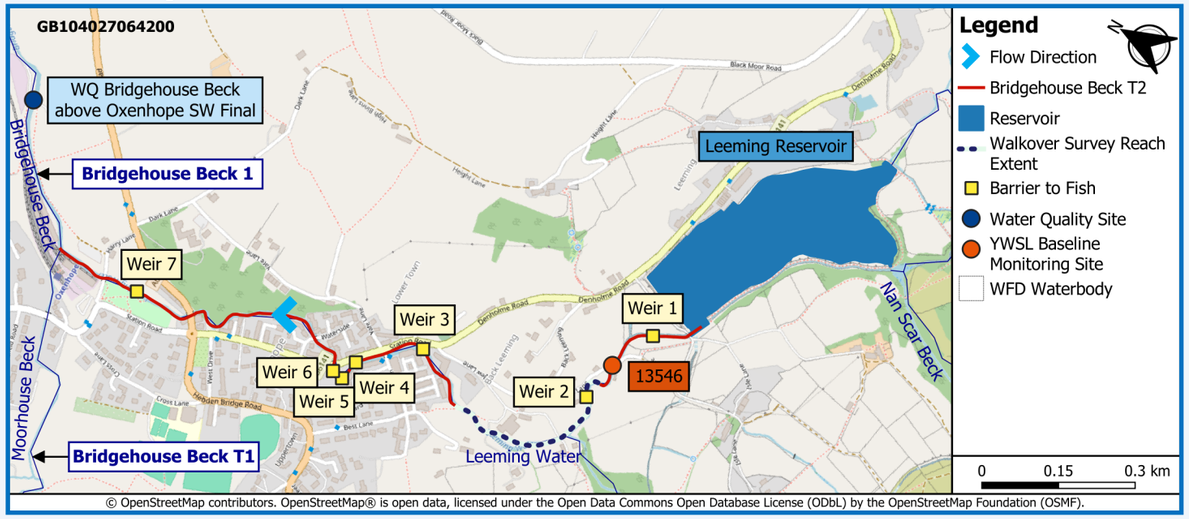
Physical Environment Information



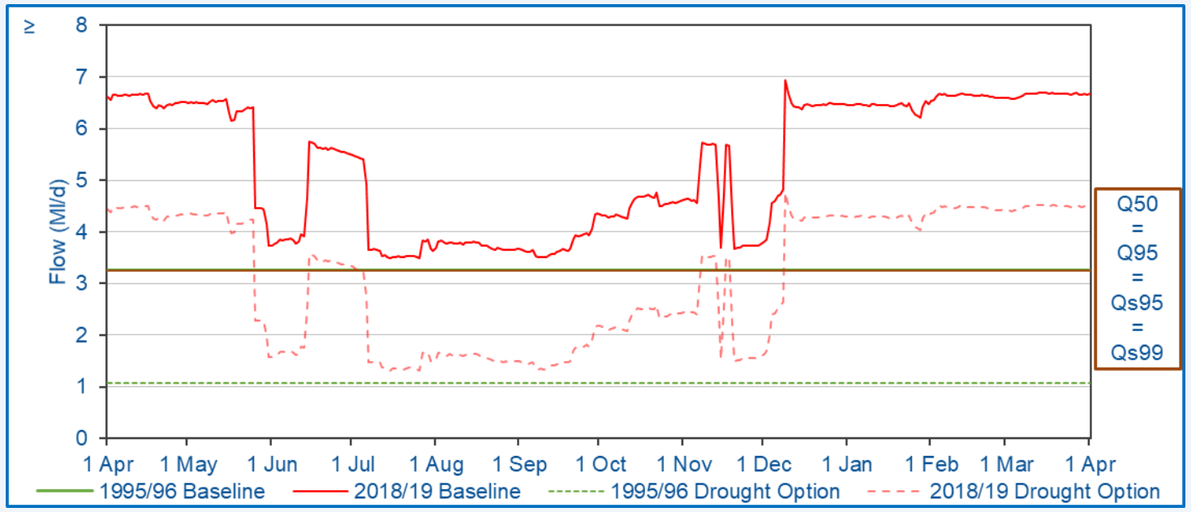




Reach Setting



River Flow Regime



Reach Setting Information:

The superficial geology is composed of alluvium along the channel path and surrounded by glacial till. Soil types along the reach are composed predominantly of slowly permeable, seasonally wet acid loamy and clayey soils. Surrounding land use is predominantly rough pasture and suburban/urban land use, particularly as the channel flows through the Oxenhope.

	Supplementary Information
Catchment Area at Assessment Point	4.5km^2
Mean Slope Gradient	1.4°
Length of Reach	1.7km
Additional Catchment Area	3.9km^2
Upstream Reach	N/A
Downstream Reach	Bridgehouse Beck 1

-	Reference Conditions (Ml/d)	Drought Plan Conditions (Ml/d)	% Reduction	Impact
Q_s95	3.25	1.07	67	Summer Major
Q_s99	3.25	1.07	67	
Q95	3.25	1.07	67	Winter Major
Q50	3.25	1.07	67	

There are no significant flow additions/ reductions associated with this reach

River Habitats

River Water Quality

There are no significant water quality pressures associated with this reach

There are no water quality monitoring sites in Bridgehouse Beck T2. As such the most upstream monitoring site in the downstream reach (Bridgehouse Beck 1), Bridgehouse Beck Above Oxenhope Sw Final (NE49400075) has been used. The average pH between 2014-2023 was 7.8 with a maximum temperature of 15.4°C for the same period.

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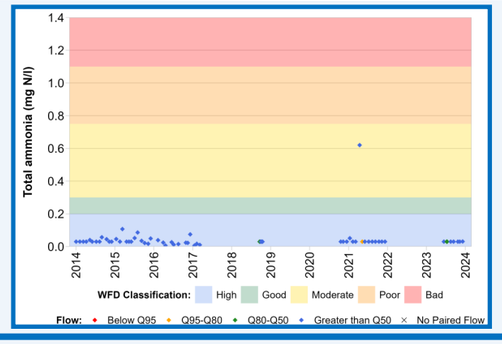
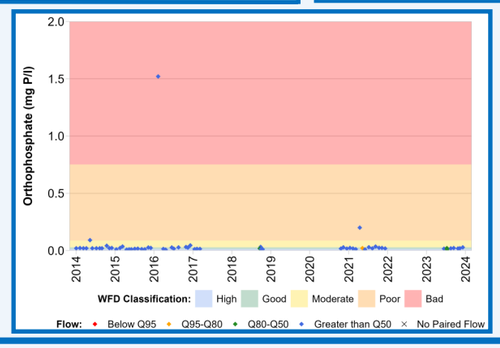
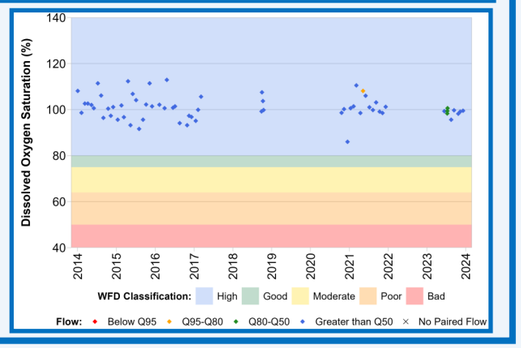
Figure A4.7

Bridgehouse Beck T2

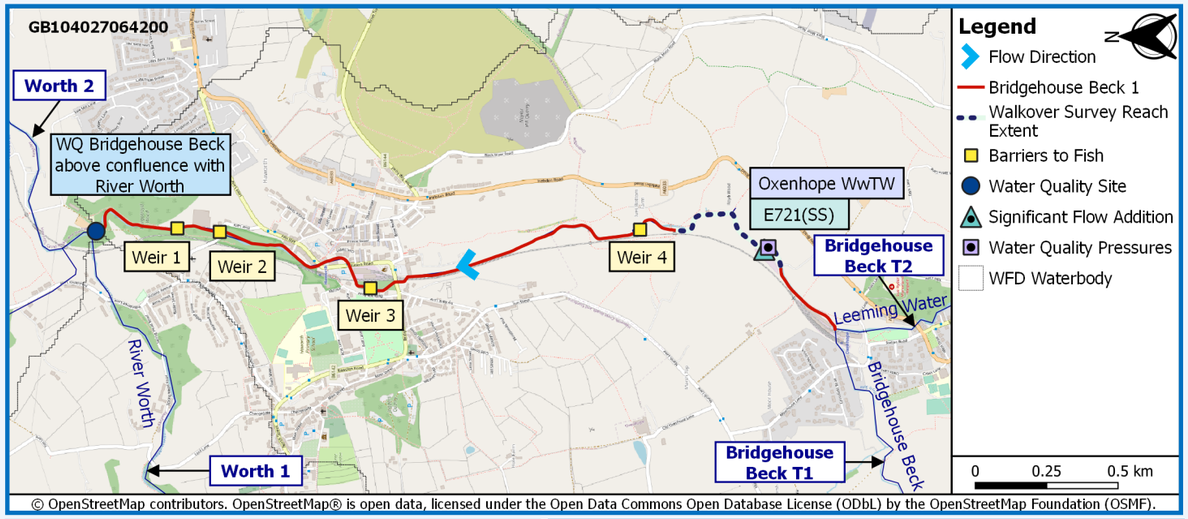
Physical Environment Information



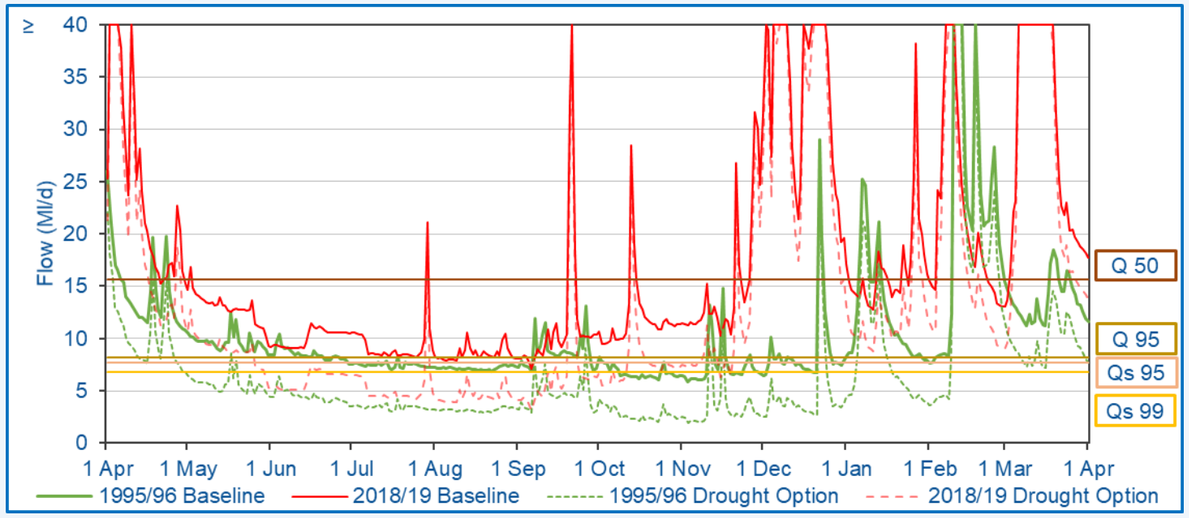




Reach Setting



River Flow Regime



Reach Setting Information:

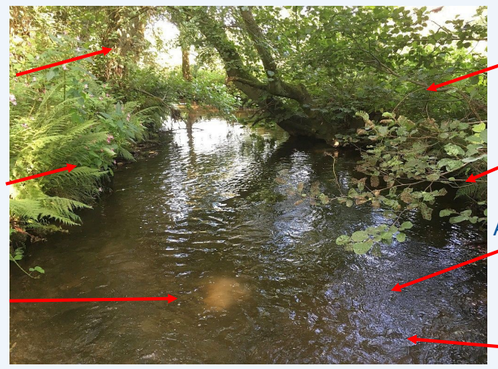
The superficial geology is composed of alluvium along the channel path and surrounded by glacial till. Soil types along the reach are composed predominantly of slowly permeable, seasonally wet acid loamy and clayey soils. Surrounding land use is predominantly rough pasture and improved grassland with suburban/urban land use dominating as the channel flows through Haworth.

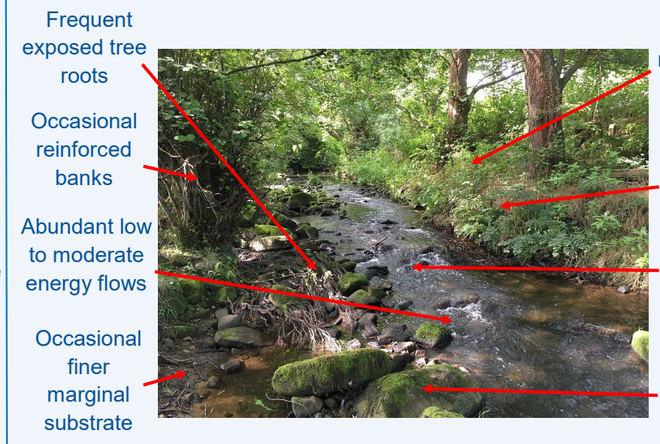
	Supplementary Information
Catchment Area at Assessment Point	14.8km^2
Mean Slope Gradient	0.7°
Length of Reach	3.2km
Additional Catchment Area	4.3km^2
Upstream Reach	Bridgehouse Beck T1,T2
Downstream Reach	River Worth 2

-	Reference Conditions (Ml/d)	Drought Plan Conditions (Ml/d)	% Reduction	Impact
Q_s95	7.82	3.80	51	Summer Major
Q_s99	6.87	2.85	58	
Q95	8.28	4.26	48	Winter Major
Q50	15.6	11.6	26	

Significant Flow Additions/Reductions	Flow Rate (Ml/d)	Abstraction / Discharge
Oxenhope WwTW E721(SS)	0.91	Discharge

River Habitats





River Water Quality

Significant Water Quality Pressures	Permit Conditions
Oxenhope WwTW E721 (SS)	0.91 Ml/d DWF 1.63 Ml/d Daily Max 11 mg/l (95th percentile) 40mg/l (maximum) Ammonia (N) 50mg/l (95th percentile) 100mg/l (maximum) BOD ATU

There are two water quality monitoring sites in Bridgehouse Beck 1. As the upstream site, Bridgehouse Beck Above Oxenhope Sw Final (NE-49400075), has been used to characterise Bridgehouse Beck T1 and T2 assessments the next downstream site, Bridgehouse Beck Above Conf With R.Worth (NE49400074), has been used. The average pH between 2014-2023 was 7.9 with a maximum temperature of 15.7°C for the same period.

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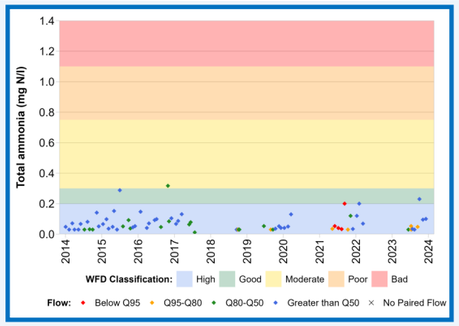
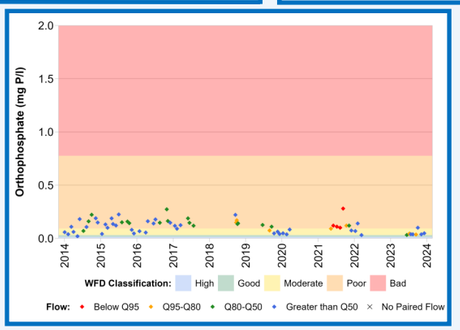
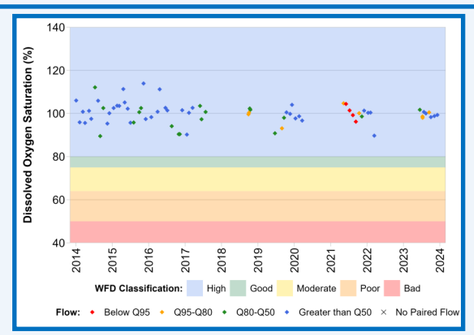
Figure A4.9

Bridgehouse Beck 1

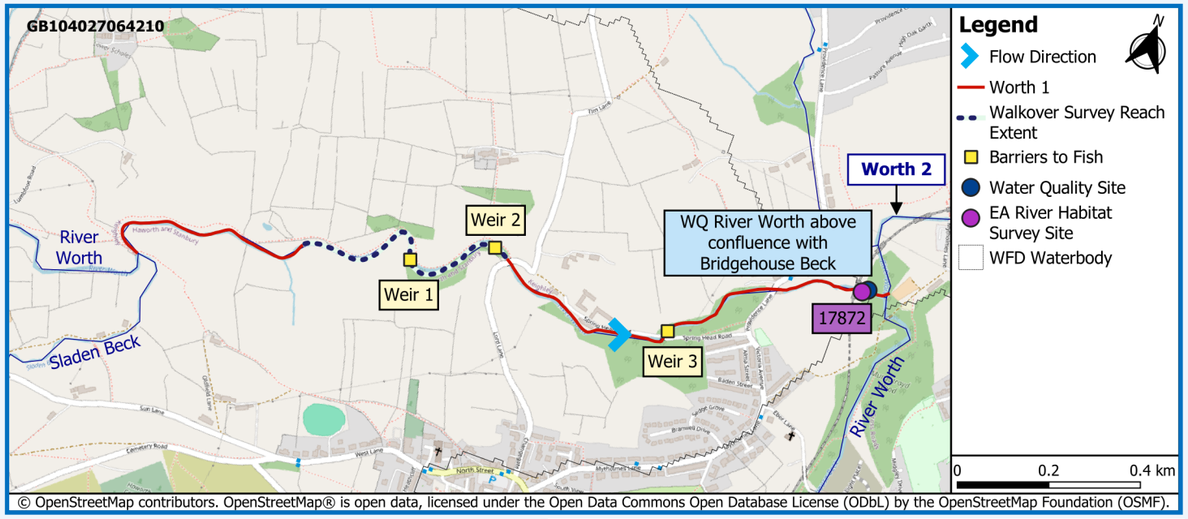
Physical Environment Information







Reach Setting

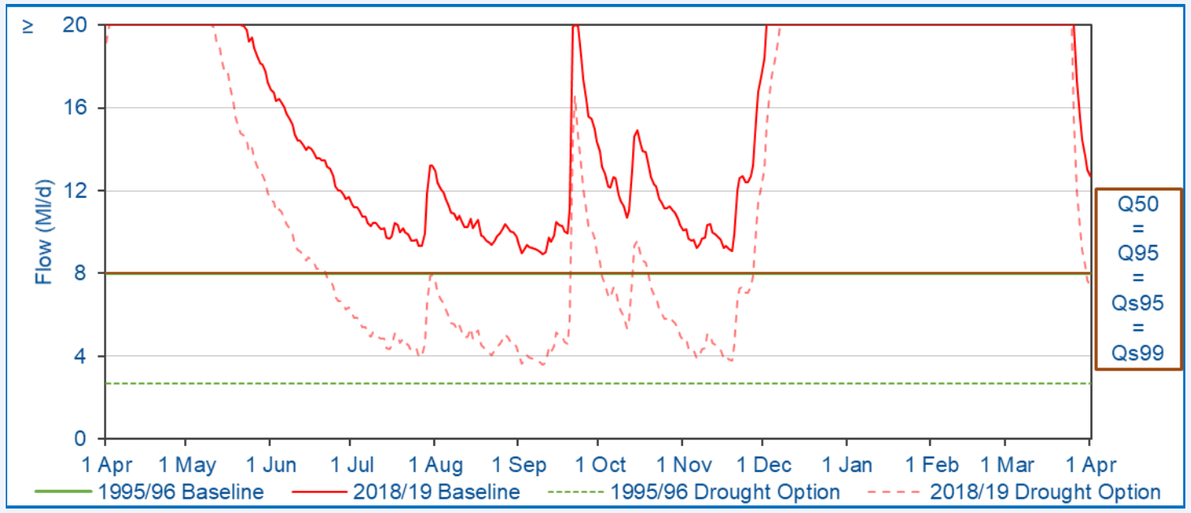


Reach Setting Information:

The superficial geology of the reach is predominantly glacial till with alluvium underlying the reach and scattered glaciofluvial deposits. Soil types along the reach are composed predominantly of slowly permeable, seasonally wet acid loamy and clayey soils. Surrounding land use is predominantly improved grassland with some rough pasture. Suburban/urban land use increases slightly towards the end of the reach prior to the confluence with Bridgehouse Beck.

	Supplementary Information
Catchment Area at Assessment Point	19.5km^2
Mean Slope Gradient	0.6^o
Length of Reach	2.0km
Additional Catchment Area	4.3km^2
Upstream Reach	N/A
Downstream Reach	River Worth 2

River Flow Regime



-	Reference Conditions (Ml/d)	Drought Plan Conditions (Ml/d)	% Reduction	Impact
Q_s95	8.00	2.67	67	Summer Major
Q_s99	8.00	2.67	67	
Q95	8.00	2.67	67	Winter Major
Q50	8.00	2.67	67	

There are no significant flow additions/ reductions associated with this reach

River Habitats

River Water Quality

There are no significant water quality pressures associated with this reach

There is one water quality monitoring sites in Worth 1: River Worth Above Conf Bridgehouse Beck (NE49400825). The average pH between 2014-2023 was 7.8 with a maximum temperature of 16.7^{o}C for the same period.

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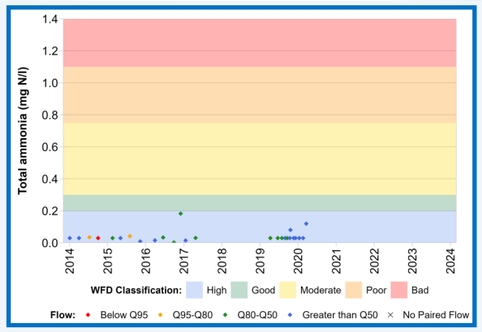
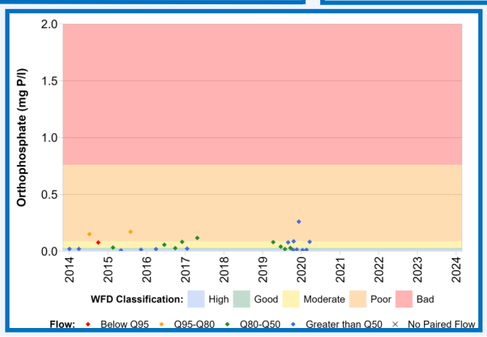
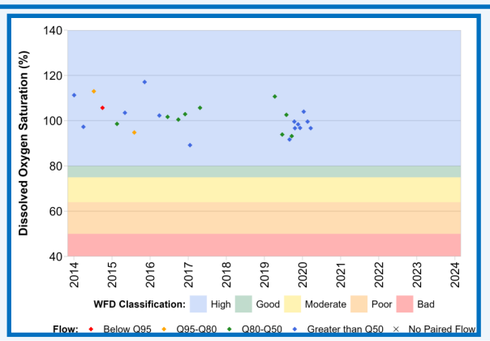
Figure A4.10

River Worth 1

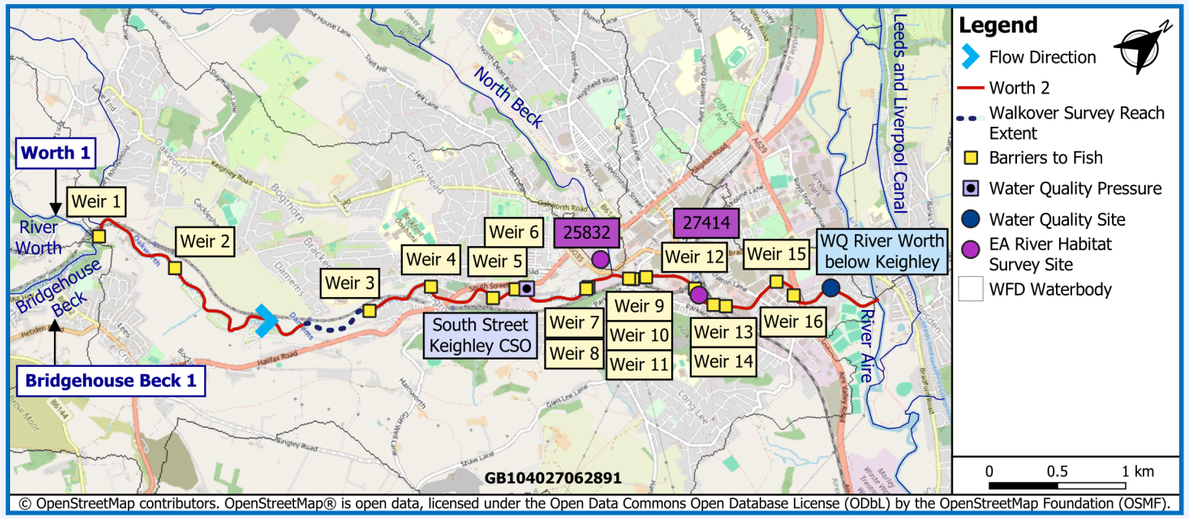
Physical Environment Information



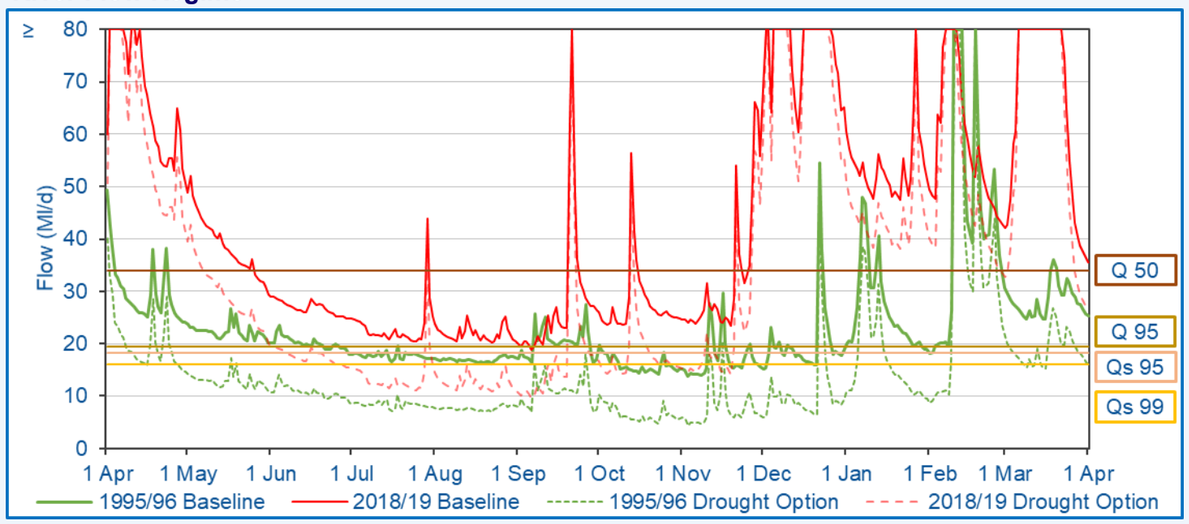




Reach Setting



River Flow Regime



Reach Setting Information:

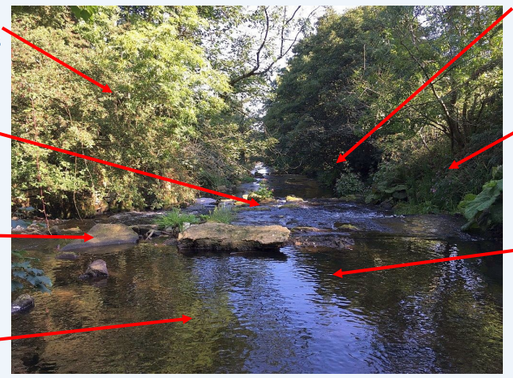
The superficial geology is composed of alluvium along the channel path and surrounded by glacial till. Extensive alluvial fan deposits are located around the confluence with the River Aire at Keighley. Soil types along the reach are composed predominantly of slowly permeable, seasonally wet acid loamy and clayey soils with some freely draining, slightly acid loamy soils around the confluence with the River Aire. Suburban/urban land use increases as the channel flows through Keighley.

	Supplementary Information
Catchment Area at Assessment Point	42.9km^2
Mean Slope Gradient	0.58^o
Length of Reach	7.2km
Additional Catchment Area	31.1km^2
Upstream Reach	Bridgehouse Beck 1, Worth 1
Downstream Reach	N/A

-	Reference Conditions (Ml/d)	Drought Plan Conditions (Ml/d)	% Reduction	Impact
Q_s95	18.6	9.21	50	Summer Major
Q_s99	16.2	6.87	58	
Q95	19.6	10.2	48	Winter Major
Q50	34.8	25.4	27	

There are no significant flow additions/ reductions associated with this reach

River Habitats



River Water Quality

Significant Water Quality Pressures	Permit Conditions
South Street Keighley CSO WRA8110 A1	Intermittent discharge
Oxenhope WwTW E721 (SS) (continued risk from discharge in Bridgehouse Beck 1)	0.91 Ml/d DWF 1.63 Ml/d Daily Max 11 mg/l (95th percentile) 40mg/l (maximum) Ammonia (N) 50mg/l (95th percentile) 100mg/l (maximum) BOD ATU

There is one water quality monitoring sites in Worth 2. As such the location, River Worth Below Keighley (NE49400828) has been used. The average pH between 2014-2023 was 8.1 with a maximum temperature of 16.3^{o}C for the same period.

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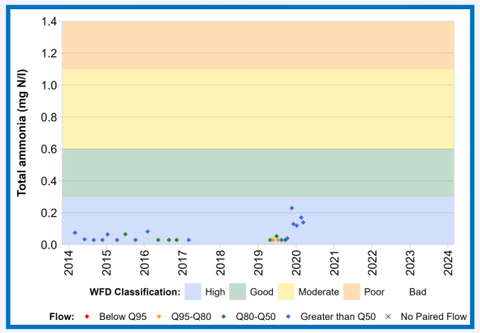
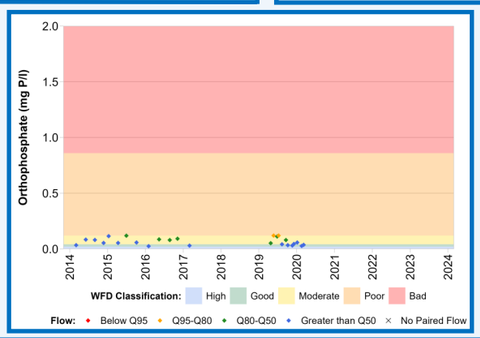
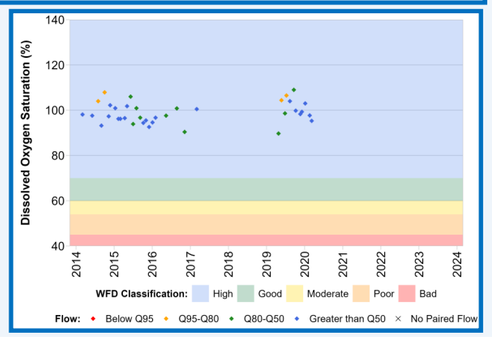
Figure A4.12

River Worth 2

Physical Environment Information







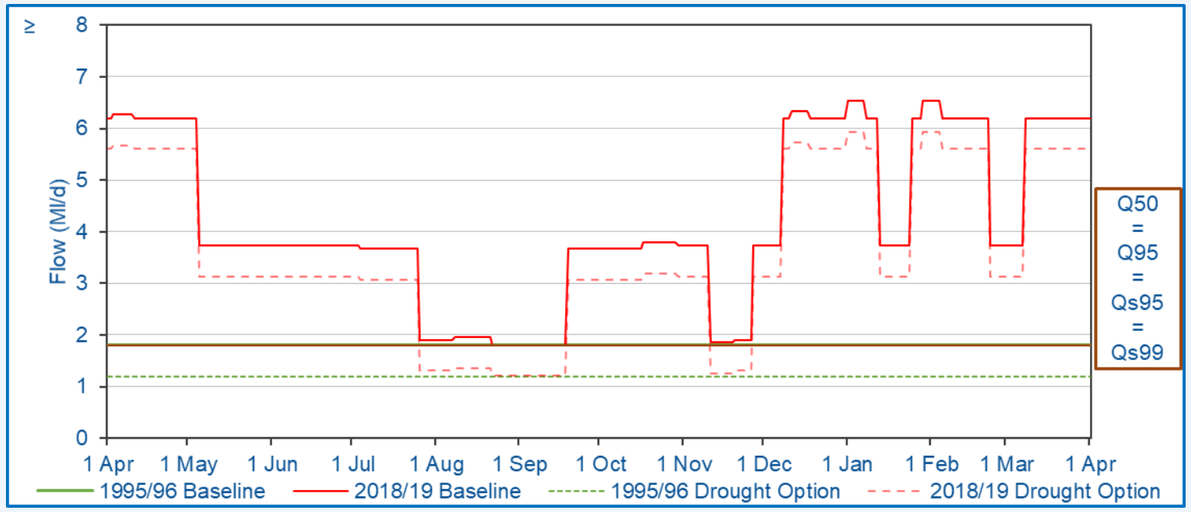
Reach Setting

Reach Setting Information:

The superficial geology is limited with only glacial till and some hummocky glacial deposits identified around the reservoir. Soils in the reservoir catchment are predominantly composed of a mixture of freely draining, slightly acid loamy soils around the reservoir and slowly permeable, wet, very acid upland soils in the remainder of the catchment. Urbanisation is very limited with a small group of houses located at ~0.3km and a farm located at ~0.8km downstream.

	Supplementary Information
Catchment Area at Assessment Point	8.0km^2
Mean Slope Gradient	0.7°
Length of Reach	1.6km
Additional Catchment Area	1.3km^2
Upstream Reach	N/A
Downstream Reach	N/A

River Flow Regime



-	Reference Conditions (Ml/d)	Drought Plan Conditions (Ml/d)	% Reduction	Impact
Q_s95	1.80	1.20	33	Summer Major
Q_s99	1.80	1.20	33	
Q95	1.80	1.20	33	Winter Major
Q50	1.80	1.20	33	

There are no significant flow additions/ reductions associated with this reach

River Habitats

River Water Quality

There are no significant water quality pressures associated with this reach

There are no water quality monitoring points in Denholme Beck 1, as such the next location in the downstream reach (Harden Beck 1), Harden Beck at Harden (NE49400457), has been used. The average pH between 2014-2023 was 8.0 with a maximum temperature of 16.9°C for the same period.

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Figure A4.13

Denholme Beck 1

Physical Environment Information