File Note

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Subject	Addendum to Ammanford WFD Screening and Scoping Assessment (Rev 01)		

1 Introduction

Natural Resources Wales (NRW) proposes to implement a scheme to reduce the risk of flooding to the town and community of Ammanford, Carmarthenshire. The area has been susceptible to flooding, most recently in 2009. Following assessment of options, NRW selected a scheme for implementation comprising of a series of flood walls and embankments installed along the banks of the River Loughor (between Llwyn-y-Bryn and Coleg Sir Gar) and small scale sediment removal from a section of the channel under and immediately adjacent to the A483 road bridge; as described below. No in-river works are required for construction of the flood walls and flood bunds; however, the small-scale sediment removal, flow deflector and ramp installation will require in-river working. The proposals consist of:

- **Coleg Sir Gar Wall** – Reinforced concrete stem wall 60m in length and up to ~1.2m in height.
- **Tir-y-Dail Fish Pass** - four pre-barrages downstream of the Tir-y-Dail weir. The barrages are anticipated to comprise of block stones shaped in convex curves incorporating concrete notches. The four pre-barrages will be installed with deep streaming flow notches to allow fish passage.
- **Cwmllwchwr Mill Wall & Ground Lowering –** A 75m concrete wall, up to ~1.5m in height between the existing commercial units to the south of Station Road and the eastern bank of the River Loughor. The wall is accompanied by an area of ground lowering (c. 80m x 20m) to the east of the pre-barrage fish pass to improve conveyance during flood events. The lowered area will include a 1:3 slope back up to existing ground level. Erosion protection consisting of rip rap and concrete cellular units will be installed to the riverbank along the new wall.
- **Station Road** - Construction of 2no. reinforced concrete stem walls along both banks of the River Loughor to the north of the Station Road bridge with height up to 1.0m above the existing ground level:
    - ***Heol Haydn Wall*** – The retaining wall is proposed to be 208m in length.
    - ***Shands Road Wall*** – The eastern flood defence is currently proposed to be in four sections of 87m, 12.1m, 16m and 30m in length and utilise three existing commercial buildings, with additional installed tanking, as part of the defence.

- **Tir-Y-Dail Bund** – A flood bund 180m in length and up to 2.6m in height. The bund is set back approximately 100m from the river, will include a 4.0m wide crest width for maintenance access and will be gently sloped (1V:3.5H to 1V:5H) to enable the embankment to fit with the local character. Minor ground raising (c.100mm) will be provided along the northerly tie-in to Shands Road to cut off a potential flood path.
- **Railway Bridge Wall** – Reinforced concrete stem wall 27.4m in length and 1.0m in height.
- **Bonllwyn Farm Wall** – Mass concrete wall 79m length and 0.98m in height tying into the railway bridge parapet.
- **A483 Llandybie Bridge** – small-scale sediment removal from under the bridge and installation of flow deflectors upstream to avoid further build-up of gravel.
- **Bonllwyn Wall** – Reinforced concrete stem wall 102m in length and up to 1.5m in height. A permanent access track will provide maintenance access to the flow deflectors from Heol Llwyd in the Bonllwyn Estate.
- **Parc Henry Lane Bund** – Minor ground raising along approximately half of the field to south of the new developments, transitioning to a flood bund up to ~0.8m in height. The embankment will include a 2m crest width for maintenance access and will be contoured with 1V:3H slopes.

JBA Consulting were commissioned by NRW in 2019 to carry out a Water Framework Directive (WFD) Screening and Scoping Assessment for the proposed scheme. The WFD, including further details of the scheme, can be found in Appendix A.

Arup have been commissioned to provide an addendum to the original WFD assessment following changes to the scheme design, including the addition of a fish pass at Tir-y-Dail weir. This note includes consideration that the legislation and WFD data included within the Preliminary WFD is still valid and focuses primarily on the effects associated with the scheme design changes and the impact of these changes on achieving WFD objectives.

2 Review of Legislation and Baseline Data

The original WFD assessment was completed in April 2019. Since this, there have been no changes in legislation or guidance that impact upon the original assessment or its conclusions.

The original assessment used WFD classification data compiled for the 2018 Cycle 2 Interim Update. This remains the most recent and appropriate information to use. There have been no changes in the extent of WFD protected areas in the vicinity of the proposed scheme.

3 Scheme Design Changes

Changes of relevance to the WFD assessment have been made to the scheme design since the previous assessment was undertaken. These are:

- the construction of timber flow deflectors and a river access ramp in the River Loughor, upstream of the A483 road bridge;

- the construction of a fish pass consisting of four pre-barrages downstream of the Tir-y-Dail weir, including an area of ground lowering and associated erosion protection to the eastern bank to improve flow conveyance;
- the change in defence type from earth bunds to concrete walls at the College, Railway and Bonllwyn structures.

The original scheme involved the ongoing dredging of the existing gravel bar in the River Loughor beneath the A483 road bridge to increase capacity of the river in this location. The initial dredging of the gravel bar will remain but will be complemented by the introduction of flow deflectors upstream of the A483 road bridge. The flow deflectors will increase the velocity of water entering the A483 road bridge and seek to discourage the reestablishment of the gravel bar and the need for further dredging. The flow deflectors are still in development but are anticipated to consist of a structure on the left bank of the River Loughor that protrudes into the channel to increase water velocities on the right hand side of the channel beneath the bridge. The deflectors will be angled at 45 degrees to the flow direction and made of timber. A concrete access ramp will be constructed immediately upstream to provide maintenance access.

The planning drawings of the scheme are included in Appendix B.

4 Assessment of Effects

Activities associated with the scheme design changes may result in an impact on WFD objectives during construction and/or operation. Details of the proposed activities required to implement the scheme design changes that could impact WFD objectives are provided in Table 1 below. The table also details whether the activities can be screened out of assessment or should be carried through to detailed assessment.

Table 1: Screening of proposed activities against WFD objectives

Proposed activity		**Assessment of impacts**
Construction (temporary) activities		
Pre-barrage fish pass and ground lowering	Works in or near to a WFD waterbody	**Potential impacts:** The introduction of the pre-barrages and land lowering on the eastern riverbank will require temporary works in and near to the watercourse. Impacts from construction activities in or near a watercourse could impact upon water quality through sediment mobilisation from site run off, accidental spillage of pollutants, and release of concrete contaminated waters to a watercourse. **Mitigation:** It is assumed that the contractor will be familiar with typical methods for working within or near watercourses, including the implementation of best practice working practices (e.g. Guidance for Pollution Prevention 5: Work and maintenance in or near water). Such practices include ensuring that: • uncovered soil is exposed for a minimal period before vegetation is re-established to minimise sediment runoff. Biodegradable erosion control matting should be used to reduce soil runoff whilst vegetation is re-established. • suitable measures (e.g. sedimats, silt fencing, bubble curtains) are installed when working in or along watercourses to contain any disturbed sediment. • concrete pouring takes place in the dry and suitable measures are in place to contain, treat or remove any contaminated waters.

Proposed activity		Assessment of impacts
		• all operatives are trained in what to do in the event of an accidental spillage and that suitable equipment is kept on site to contain any spill should it occur. • refuelling takes place away from watercourses, that all plant and equipment is regularly checked and maintained to prevent leaks and that biodegradable fluids are used wherever possible. **Outcome:** Provided the mitigation measures above are implemented, construction activities pose a minimal risk to the water environment with any potential impacts only lasting for a short period of time enabling a rapid recovery in the quality of the water environment. This activity is determined to not result in a decline in any WFD quality elements or prevent them from attaining Good status or potential in the future.
	Dewatering and partial diversion of WFD waterbody	**Potential impact:** Construction works could also involve dewatering and partial diversion of the WFD waterbody to create a dry working area for construction activities. Partial diversion has the potential to alter flow velocity and cause scour thus impacting the morphology of the WFD waterbody. Changes in flow velocity and sediment loading have the potential to impact fish species within the waterbody especially if works are undertaken within the fish embargo period (15th October to 15th April inclusive). **Mitigation:** The works will be undertaken outside the fish embargo period to reduce the impacts on fish species within the waterbody and the construction methodology will require consent from NRW via the flood risk activity permitting process. **Outcome:** Provided the mitigation measures above are implemented, construction activities pose a minimal risk to the water environment with any potential impacts only lasting for a short period of time enabling a rapid recovery in the quality of the water environment. This activity is determined to not result in a decline in any WFD quality elements or prevent them from attaining Good status or potential in the future.
	Noise and vibration	**Potential impact:** The construction of the pre-barrages has the potential to cause disrupt the migration and/or spawning of fish. **Mitigation:** It is assumed that the contractor will be familiar with typical methods for working within or near watercourses. The works will be undertaken outside the fish embargo period and the construction methodology will be reviewed by NRW as part of the flood risk activity permitting process. **Outcome:** Provided the mitigation measures above are implemented, construction activities pose a minimal risk to the water environment with any potential impacts only lasting for a short period of time enabling a rapid recovery in the quality of the water environment. This activity is determined to not result in a decline in any WFD quality elements or prevent them from attaining Good status or potential in the future.
Flow deflectors	Works in or near a WFD waterbody	**Potential impact:** The introduction of the flow deflectors will require temporary works in and near to the watercourse. Impacts from construction activities in or near a watercourse could include a reduction in water quality through sediment mobilisation from site run off, accidental spillage of pollutants, and release of concrete contaminated waters to a watercourse. **Mitigation:**

Proposed activity		Assessment of impacts
		It is assumed that the contractor will be familiar with typical methods for working within or near watercourses, including the implementation of best practice working practices (e.g. Guidance for Pollution Prevention 5: Work and maintenance in or near water). Such practices include ensuring that: • uncovered soil is exposed for a minimal period before vegetation is re-established to minimise sediment runoff. • suitable measures (e.g. sedimats, silt fencing, bubble curtains) are installed when working in or along watercourses to contain any disturbed sediment. • concrete pouring takes place in the dry and suitable measures are in place to contain, treat or remove any contaminated waters. • all operatives are trained in what to do in the event of an accidental spillage and that suitable equipment is kept on site to contain any spill should it occur. • refuelling takes place away from watercourses, that all plant and equipment is regularly checked and maintained to prevent leaks and that biodegradable fluids are used wherever possible. **Outcome:** Provided the mitigation measures above are implemented, construction activities pose a minimal risk to the water environment with any potential impacts only lasting for a short period of time enabling a rapid recovery in the quality of the water environment. This activity is determined to not result in a decline in any WFD quality elements or prevent them from attaining Good status or potential in the future.
	Partial diversion of WFD waterbody	**Potential impact:** Construction works will require temporary works within the watercourse to enable construction of the flow deflectors. The temporary works have the potential to alter flow velocities and cause scour thus impacting the morphology of the WFD waterbody. Changes in flow velocity and sediment loading have the potential to impact fish species within the waterbody especially if works are undertaken within the fish embargo period (15th October to 15th April inclusive, specific timescales to be agreed with NRW fisheries team). **Mitigation:** The works will be undertaken outside the fish embargo period and the construction methodology (including temporary works) will be reviewed by NRW as part of the flood risk activity permitting process. **Outcome:** Provided the mitigation measures above are implemented, construction activities pose a minimal risk to the water environment with any potential impacts only lasting for a short period of time enabling a rapid recovery in the quality of the water environment. This activity is determined to not result in a decline in any WFD quality elements or prevent them from attaining Good status or potential in the future.
One-off dredging of gravel bar beneath the A483 Bonllwyn Bridge		**Potential impact:** This activity will remove bed material from the river that has accumulated on the right hand side of the channel beneath the road bridge. Visual inspection by a fluvial geomorphologist and a larger scale sediment study indicates that this bar is of limited habitat value. The limited habitat value has been determined due to the type of material (large, angular and immobile) and its location beneath the low bridge, which limits sunlight availability and therefore habitat diversity. The removal of the bar may locally impact upon invertebrates and has the potential to alter the hydromorphology of the river channel. **Mitigation:**

Proposed activity		Assessment of impacts
		A sediment study has been undertaken to determine the sediment regime of the River Loughor surrounding the road bridge. This study evidenced that sediment is being replenished from upstream and the removal of the bar is unlikely to result in larger scale morphological changes or habitat degradation. **Outcome:** Based on the additional study undertaken, this activity will only impact upon a localised area of river habitat of limited value. This activity is determined to not result in a deterioration in any WFD quality elements at a water body scale or prevent them from attaining Good status or potential in the future.
Operational (permanent) activities		
Pre-barrage fish pass and ground lowering	Changes in the downstream passage of sediment as a result of the in-channel structures.	**Potential impact:** The pre-barrages present a physical barrier to the passage of sediment downstream and therefore sediment has the potential to accumulate behind the pre-barrages. The restriction of downstream sediment passage has the potential to reduce habitat availability and quality in the downstream watercourse over long time scales. **Assessment:** There is already a barrier to downstream sediment passage present at Tir-y-Dail in the form of the existing weir. Therefore, the pre-barrages would only act to trap sediment that currently passes over the weir. The immediate reach downstream of the existing weir has been confirmed to be sediment starved by field survey and has adjusted to a stable form to account for these conditions by incising into its bed. Initially sediment will accumulate behind the pre-barrages but over time the pools behind each structure will find an equilibrium with sediment being transferred downstream during high flow events. **Mitigation:** The design of the pre-barrages seeks to minimise the potential for sediment to accumulate in the pools so that fish passage is maintained, which also benefits downstream sediment passage. **Outcome:** The current design seeks to minimise potential impacts of sediment transfer as much as practicable. As the river downstream is already adjusted to a sediment starved state due to the existing barrier, this activity is not expected to result in a decline in any WFD quality elements or prevent them attaining Good status or potential in the future.
	Changes in local flow velocities through physical introduction of pre-barrages	**Potential impact:** Introduction of pre-barrages has the potential to alter flow velocities surrounding the structures with resulting impacts on local channel morphology (e.g. via erosion or deposition). **Assessment:** The installation of the pre-barrages will alter flow velocities downstream of the existing weir, although this effect is dampened at higher, channel forming flows. The structures will be located on a straight section of river and angled to promote the highest flow velocities in the middle of the channel, where the thalweg is currently located. Therefore, it is unlikely that the installation of these structures will cause any significant morphological changes. **Mitigation:** None required. **Outcome:** The changes to flow velocities are localised to the area through the structures, which are designed to accommodate this. Therefore, additional mitigation is not required,

Proposed activity		Assessment of impacts
		and the activity is not expected to result in a decline in any WFD quality element or prevent them attaining Good status or potential in the future.
	Installation of a fish pass	This installation of the fish pass has the potential to result in a positive impact upon multiple WFD water bodies. The three WFD water bodies upstream of the structure are all at Good or High status for fish so this activity will not help achieve an improved status classification. Despite this, the installation of a fish pass will add resilience to the ecosystem by providing access to a greater area and diversity of habitat, thus helping to prevent future deterioration.
	Land lowering on the eastern riverbank and associated erosion protection	**Potential impact:** The lowering of the riverbank and introduction of erosion protection has the potential to reduce the quality of bank habitat and result in morphological changes which could further degrade habitat quality. **Assessment:** The area of ground lowering will be inundated relatively infrequently (at around the 50% AEP event) by the river. It will therefore remain a mix of terrestrial and riparian habitat. The northern portion of the land lowering will require erosion protection measures due to the interaction between the existing weir, fish pass structure and new flood wall. This results in very high peak velocities in a flood event (~6m/s) which will require some form of hard engineering to prevent scour, anticipated to be a combination of rip rap and geocellular units (to be confirmed at detailed design). The inclusion of these measures will result in a localised reduction in bank habitat quality and has the potential to induce scour at the upstream or downstream ends of the erosion protection. Mitigation is required to reduce these effects. **Mitigation:** The habitat quality of the southern portion of the land lowering will be enhanced by the planting of a wet woodland mix, which will offset the loss of low-quality existing bank habitat adjacent to the weir. The detailed design of the erosion protection will consider the use of bioengineering products (e.g. coir rolls, willow revetments) where flow velocities permit and will ensure the design of the tie-ins to the existing riverbank are sensitively designed to minimise the risk of scour. **Outcome:** The localised effects of the land lowering and associated erosion protection will be mitigated by planting elsewhere in the lowered land area and sensitive design to reduce the likelihood of wider effects to geomorphology. Therefore, the activity is not expected to result in a decline in any WFD quality element or prevent them attaining Good status or potential in the future.
Flow deflectors	Maintenance and management of flow deflectors	**Potential impact:** The flow deflectors will require infrequent maintenance to remove accumulated debris or sediment, which may require an excavator to access the channel via the associated ramp. This activity introduces a potential risk of pollution or physical damage to the channel. **Assessment:** The anticipated frequency of maintenance is minimal and is likely to be somewhat reactive depending on river flows. Therefore, the risk of a pollution event or physical damage occurring is relatively low. **Mitigation:** Natural Resources Wales (or a Contractor appointed on their behalf) will undertake the maintenance activities. These will be supported by a suitable method statement and be undertaken by operatives with experience of working in or near watercourses.

Proposed activity		Assessment of impacts
		Outcome: Providing the maintenance activities are as currently envisaged, the activities are not expected to result in a decline in any WFD quality elements or prevent them attaining Good status or potential in the future.
	Change in hydromorphology as a result of the deflector and/or access ramp	**Potential impact:** High flow events have the potential to mobilise sediment around the flow deflector or access ramp and may result in unwanted sediment accumulation or scour. This may impact upon the hydromorphology of the waterbody and have subsequent effects of habitat quality or availability. **Mitigation:** The design of the flow deflector and associated access ramp is currently ongoing. The design will consider the potential for scour, with suitable measures included to protect the riverbed and bank from erosion to mitigate this risk. Anticipated changes to flow velocity are localised to the area surrounding the A483 Bonllwyn Bridge. **Outcome:** The design will include suitable mitigation to ensure this activity does not result in a decline in any WFD quality element or prevent them attaining Good status or potential in the future.

5 Enhancements

General opportunities for enhancement as part of the scheme have been included in the ECOR report. Specific opportunities with the potential to benefit WFD are listed in Table 2.

Table 2: Opportunities for enhancement to help attain WFD objectives or prevent future deterioration

Enhancement opportunity	Location	Potential benefit
Provision of a fish pass over or around large blockstone weir. The weir is likely to be a partial barrier to fish passage and also prevents the transfer of sediment downstream, although this is more significantly prevented by the Tir-y-Dail weir downstream. This fish pass could take the form of a bypass channel through the woodland to the east of the river and contribute to wider habitat benefits in this area.	River Loughor, immediately downstream of confluence with The Lash at SN 62212 13196.	This would not help attain any current WFD objectives but would add resilience to prevent future deterioration.
Treatment or removal of invasive plant species along the River Loughor. See ecological survey reports for extent and type of invasive species present.	At various locations throughout Ammanford.	Localised improvement in bank habitat, reduced risk of erosion and improved environment for the local community.
Removal and disposal of fly tipping, particularly in the area at the northern end of Shands Road.	Various locations, principally at the northern end of Shands Road adjacent to the River Loughor.	Removal of potential pollutant source to watercourse and improved environment for local community.
Investment in community awareness and involvement in the local watercourses, likely related to the construction of the flood risk scheme and fish pass. Potential opportunities include: - Provision of information boards at strategic locations where pedestrians cross or pass close to the river.	Various.	Increased community awareness and involvement may benefit pollution reporting and lead to future community investment in projects

Enhancement opportunity	Location	Potential benefit
Including A483 Bonllwyn Bridge, Station Road Bridge and crossing at northern end of Shands Road. - Involvement of community in landscape planting, litter picking or invasive species clearance alongside the flood scheme.		that benefit WFD objectives.
To minimise the effect upon downstream sediment transport, the gravel removed from the river channel beneath the A483 bridge should be stockpiled separately from other material and returned to the river downstream at a suitable location.	The section of the River Loughor surrounding the confluence with the Afon Marlas and Lash would be the next suitable location moving downstream.	Opportunity to provide more diverse river morphology with subsequent benefit to habitat diversity.

6 Conclusion

This addendum seeks to update the WFD assessment undertaken by JBA Consulting in 2019 for the Ammanford flood defence scheme following changes to the scheme design. The legislation and baseline data within the original assessment remain valid.

The proposed design changes comprise introduction of flow deflectors in the River Loughor, upstream of the A483 road bridge. The flow deflectors will increase flow velocities underneath the bridge where sediment has historically accumulated to avoid the need for regular dredging. The scheme will also now include a fish pass in the form of four pre-barrages located downstream of the weir in the River Loughor at grid reference SN 62319 12650. The pre-barrages will be installed with deep streaming flow notches to allow fish passage. An area of land lowering to improve flood flow conveyance and associated erosion protection is also proposed to the eastern bank of the fish pass.

Based on the assessment undertaken, the construction and operational activities associated with the design changes are not considered to pose a risk to the WFD quality objectives of the River Loughor.

There is the potential to include enhancements as part of the scheme that may provide future benefit to WFD objectives.

Appendix A

JBA Consulting:
OBC WFD Assessment

Ammanford Outline Business Case

Water Framework Directive Screening and Scoping

Final Report

April 2019

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Cyfoeth Naturiol Cymru
Natural Resources Wales

Contents

List of Figures

List of Tables

Abbreviations

AWIC	Acid Water Indicator Community
BAP	Biodiversity Action Plan
CEMP	Construction Environmental Management Plan
DO	Dissolved Oxygen
ECOR	Environmental Constraints and Opportunities Record
GEP	Good Ecological Potential
GES	Good Ecological Status
HMWB	Heavily Modified Waterbody
INNS	Invasive Non-Native Species
MAGIC	Multi-Agency Geographic Information for the Countryside
NERC	Natural Environment and Rural Communities
NRW	Natural Resources Wales
PPE	Personal Protective Equipment
RBMP	River Basin Management Plan
SAC	Special Conservation Area
WFD	Water Framework Directive

References

JBA Consulting 2018, Ammanford Outline Business Case, Preliminary Ecological Appraisal, Draft Report, December 2018.

JBA Consulting 2019a, Geomorphology Assessment, Ammanford, Final Report, February 2019.

JBA Consulting 2019b, Ammanford OBC, Environmental Constraints and Opportunities Record, Final Report, April 2019.

1 Introduction

1.1 Background

Natural Resources Wales (NRW) is currently assessing options to reduce the risk of flooding to the town and community of Ammanford, Carmarthenshire from the River Loughor, River Lash, and River Marlas, taking into account predicted climate change. Large areas of Ammanford are susceptible to flooding and in recent history, areas of the town have flooded on four separate occasions, most recently in 2009. Apart from low embankments on the River Loughor at Tir-y-dail (SoP <5% AEP), there are no flood defences in the town along these rivers.

JBA Consulting has been commissioned by NRW to carry out a Preliminary Water Framework Directive (WFD) Assessment for the proposed scheme. The assessment has been prepared following a range of good practice guidance for WFD Assessment:

- Guidance for assessing activities and projects for compliance with the Water Framework Directive, OGN72, Version 1.1, May 2017, Natural Resources Wales.
- Advice Note 18: The Water Framework Directive, Version 1, June 2017, The Planning Inspectorate. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/06/advice_note_18.pdf
- Local Authority services and the water environment: Advice note on the Water Framework Directive, Natural Resources Wales. Available at: https://naturalresources.wales/media/2627/wfd-docs-eng.pdf
- Water Framework Directive assessment: estuarine and coastal waters – How to assess the impact of your activity in estuarine (transitional) and coastal waters for the Water Framework Directive (WFD), 9 November 2017, Environment Agency. Available at: https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters

Data on the location and status of WFD waterbodies and WFD Protected Areas has been obtained from the Water Watch Wales website[1] and the Multi-Agency Geographic Information for the Countryside (MAGIC) website[2].

1.2 Purpose of the report

The WFD (2000/60/EC) is implemented in England and Wales by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 (the Regulations). The Regulations require that Environmental Objectives are set for all surface and groundwaters in England and Wales to enable them to achieve Good Status by a defined date. These Environmental Objectives are listed below:

- Prevent deterioration in the status of aquatic ecosystems, protect them and improve the ecological conditions of waters;
- Aim to achieve at least good status for all waterbodies by 2015. Where this is not possible and subject to the criteria set out in the Directive, aim to achieve good status by 2021 or 2027;
- Meet the requirements of WFD Protected Areas;
- Promote sustainable use of water as a natural resource;
- Conserve habitats and species that depend directly on water;
- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment;

[1] Water Watch Wales Map Gallery: Waterwatchwales.naturalresourceswales.gov.uk

[2] MAGIC – magic.defra.gov.uk/MagicMap.aspx

- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and
- Contribute to mitigating the effects of floods and droughts.

Surface waterbody status is made up of biological, physio-chemical, hydromorphological and chemical quality characteristics known as 'quality elements'. These are taken from Annex V of the Directive. The overall status of a waterbody is determined by the lowest element status. Environment Agency guidance states that all quality elements need to be considered as part of a WFD assessment.

Groundwater waterbody status is defined by its 'quantitative status' and its 'chemical status'. Two classes are attributed to both quantitative and chemical status: good and poor. Both elements need to be at good status before the waterbody can be classified as good.

Under the WFD, Heavily Modified Waterbodies (HMWB) are bodies of water which are substantially changed in character as a result of physical alterations by human activity and cannot meet 'Good Ecological Status' (GES). Therefore, mitigation measures are set for the waterbody, in order to achieve 'Good Ecological Potential' (GEP).

1.3 Scope of this assessment

All new activities in the water environment need to take account of the requirements of the WFD. For a project or activity to be compliant with the WFD, it should demonstrate that:

- There is no risk of it causing a deterioration of the status of any element, in addition, for groundwater, it will limit or prevent the input of pollutants;
- There is no risk of it preventing WFD protected areas from achieving their objectives;
- It will not jeopardise any waterbody from achieving good status/potential; and
- It will contribute to the protection, enhancement and restoration of waterbodies.

This Preliminary (Screening and Scoping) WFD Assessment considers all activities that will take place as part of the proposed scheme, during both construction (where construction information is available or can be reasonable assumed) and operation, and identifies the potential risks associated with these activities and the WFD receptors that are at risk.

The NRW guidance includes detailed screening criteria that can be used to determine whether a proposed activity is not likely to cause a deterioration in the status of a waterbody. This includes a list of activities that in general will not cause a deterioration, such as 'temporary' works that do not normally last more than six months and are not likely to have a residual impact on a waterbody. The guidance also lists other physical works and defines screening thresholds for each; these thresholds help to determine whether any activity presents a risk to a waterbody and any requirements for further assessment. However, these thresholds are for guidance only and expert judgement is required to determine if a proposed activity may have an impact on a waterbody.

Published guidance also states that the assessment must consider the potential for impacts on the following:

- Protected Areas – these are defined under Article 6 of the Directive.
- Priority Habitats – these are 'habitats of principal importance for conservation and biodiversity', which are defined under Section 41 of a Natural Environmental and Rural Communities (NERC) Act 2006 in England and Section 7 of the Environment (Wales) Act 2016 in Wales.
- Invasive non-native species (INNS) – assessment of INNS is required if a development could cause the introduction or spread of INNS to a waterbody.

A detailed Compliance Assessment would be required if it cannot be concluded that the scheme would not cause deterioration or inhibit the objective status of a waterbody. Further to this and in line with WFD requirements, there would be a need to apply the Article 4.7 test to seek approval for progression of the scheme if after the full WFD

assessment – including the implementation of mitigation measures – it cannot be determined that the scheme would not cause deterioration to a waterbody or prevent in from achieving its status objectives.

1.4 Site location

Ammanford is a town in Carmarthenshire, approximately 12 miles north of Swansea (Figure 1-1). He town is situated in close proximity to a number of watercourses with relatively flashy catchments, which when combined, pose a significant flood risk (Figure 1-2).

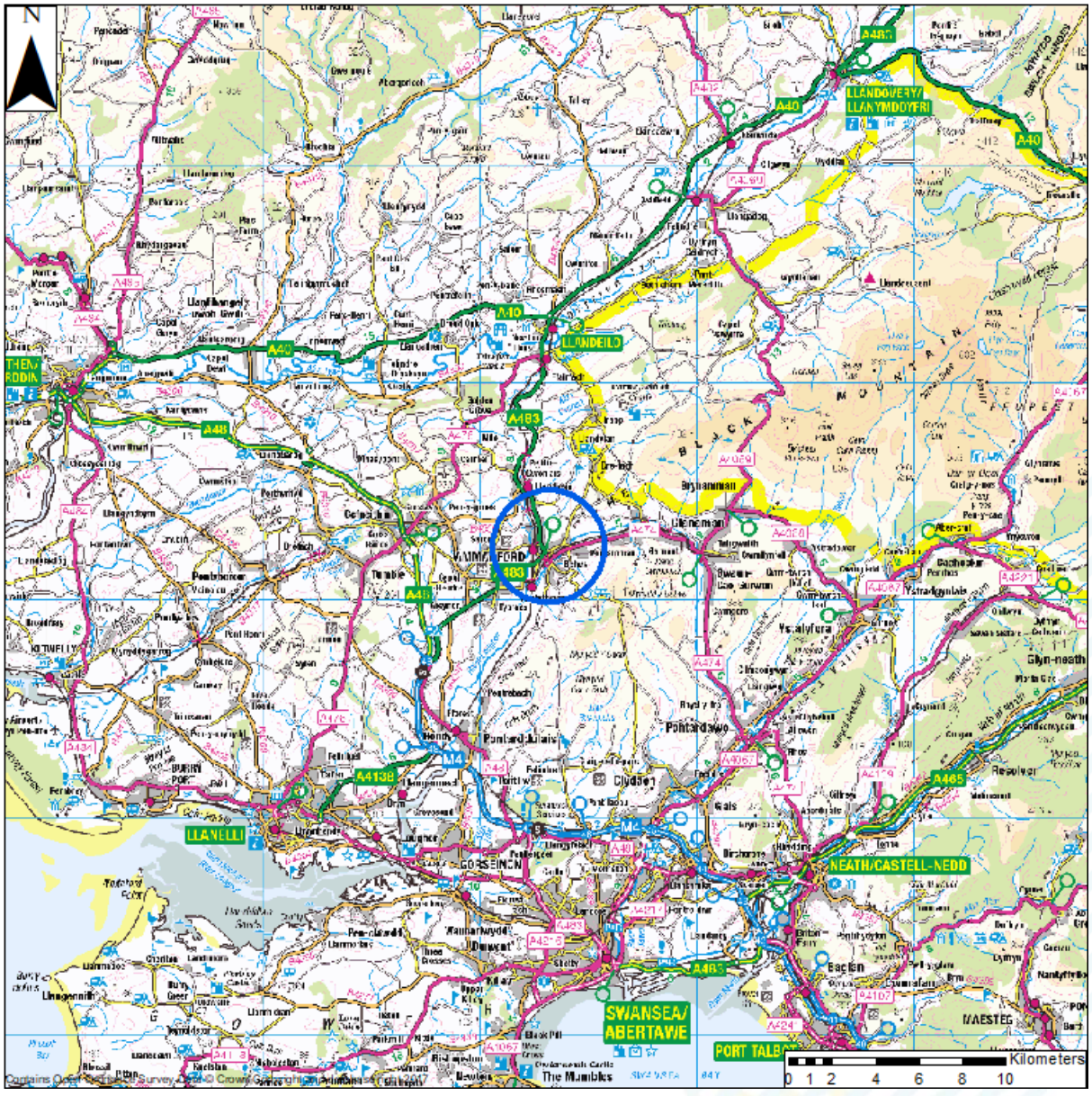

Figure 1-1: Location of Ammanford in Wales

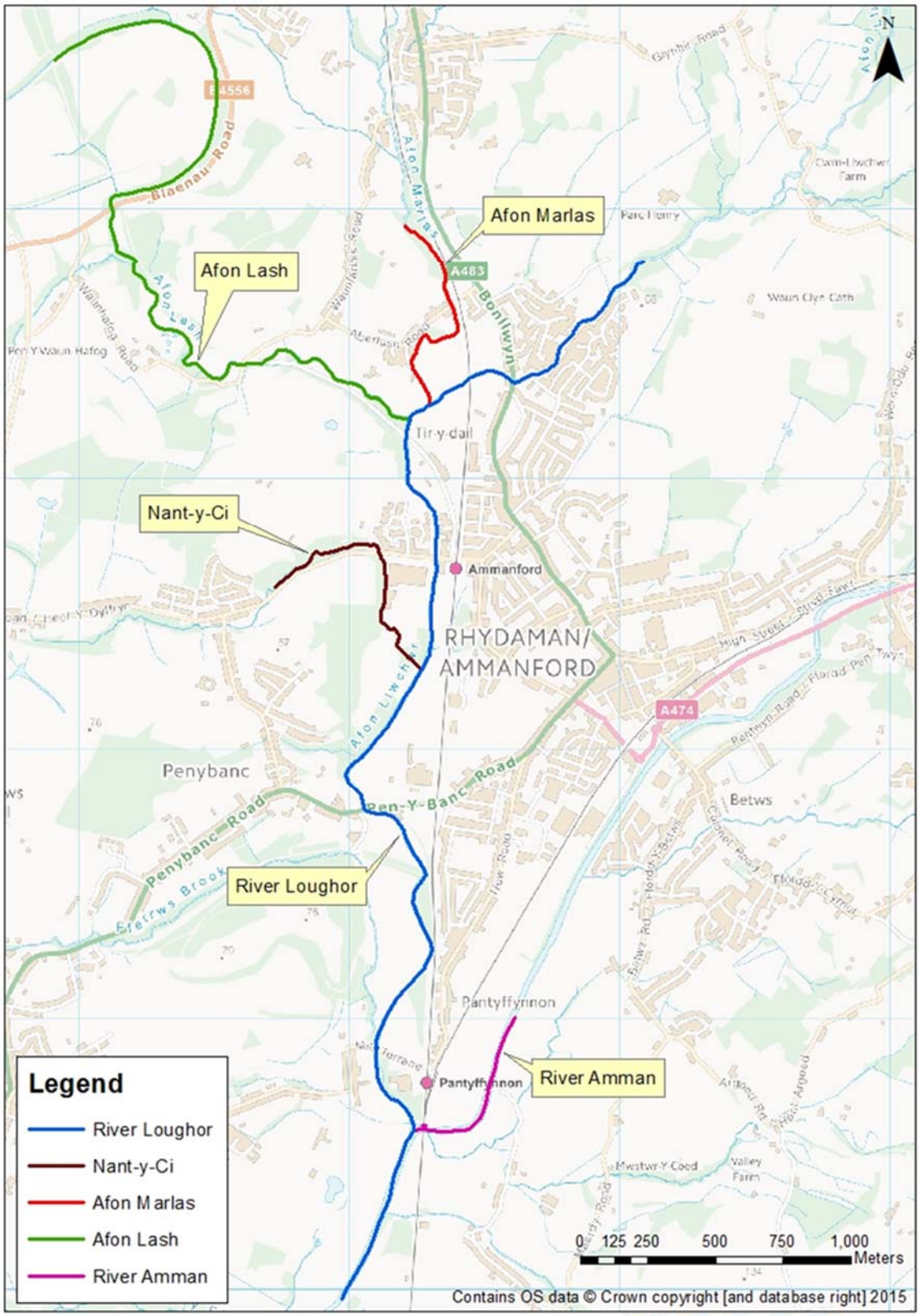

Figure 1-2: Study location and watercourses

There have been four significant flood events in Ammanford since 1978:

- 26 December 1979: Station Road flooded due to the River Loughor overtopping its banks. The Heart of Wales railway flooded at Tir-y-dail Station. Part of Dyffryn Road was flooded and closed for a period. Many residential properties were flooded;

- 22 October 1998: Flooding occurred at the Coleg Sir Gâr campus at Tir-y-dail. Six residential properties were also flooded;
- 18 May 2002: The River Marlas flooded three properties on Aberlash Road; and
- 17 July 2009: The River Loughor overtopped its banks, and flooded properties on Heol Haydn and Tir-y-dail. The A483 was closed at Pont-y-clerc and Pen-y-banc.

1.5 Proposed scheme

The preferred option consists of a series of flood walls and embankments installed along the banks of the River Loughor, between Llwyn-y-Bryn and Coleg Sir Gar, together with small-scale sediment removal from a section of the channel under and immediately adjacent to the A483 road bridge. In addition, 13 properties on Aberlash Road will be offered PFR measures.

The sections of embankments and walls to be installed as part of the scheme will be as follows:

- Area east of the railway line to Llwyn-y-Bryn. This area will contain a series of walls and embankments;
    - Immediately east of the railway in this location, there will be a grass embankment, ground raising or other similar works, to address a low spot on the riverbank. This will rise to a maximum height of 1.0m above ground level.
    - North of the garden centre off Llandybie Road, there will be a concrete wall made of Legato blocks. This will rise to 1.6m above ground level.
    - Between the River Loughor and Fford-Yr-Afon, there will be a grassed embankment, rising form ground level to a maximum height of 0.6m above ground level, before tapering back to ground level. The Tarmac footpath currently present in this location will be reinstated along the embankment crest.
- Tir-Y-Dail floodplain: within this area there will be an earth embankment traversing the entire width of the field, from the railway to Shands Road. At the Shands Road end, it will be approximately 2.5m high, and will taper downwards towards higher ground near the railway. The embankment crest will be 3m wide and suitable for vehicular access.
- Area surrounding the Station Road bridge;
    - Upstream of the Station Road bridge, flood defence wall will be constructed adjacent to both banks of the River Loughor, protecting the Gwyn Fryn Estate to the west and the industrial area off Shands Road to the east. These flood walls will be approximately 200m long, 1.2m high and faced with brick selected to match the surrounding buildings. On the eastern bank, the new wall will tie-in to existing industrial buildings close to the bank. These buildings will be adapted to form part of the flood defence line.
    - Downstream of the bridge, an earth embankment will be constructed on the western bank of the River Loughor to protect Coleg Sir Gar. The grassy embankment will rise from ground level to a maximum height of 1.0 metre above ground level before tapering back down to ground level.

PFR measures will be offered to 13 houses along Aberlash Road (SN 62353 13625) to reduce flooding from the River Marlas. Measures could include fitting barriers on doors and installing non-return valves on drains.

Beneath the A483 Llandybie Road bridge (SN 62602 13373), an existing gravel bar in the River Loughor will be removed. This will increase the capacity of the river in this location, thereby reducing the severity of flood events. As this is a naturally occurring feature, it is anticipated that periodic removal of the gravel bar will be required every 5 to 10 years.

2 Baseline Conditions

2.1 Relevant WFD waterbodies and screening

The Water Watch Wales website shows that the proposed defences lie along the 'Loughor – headwaters to confluence with Marlas river' waterbody (WFD Ref: GB110059032130). Immediately upstream of the proposed defences is the 'Marlas – headwaters to confluence with Loughor river' waterbody (WFD Ref: GB110059032160) and 'The Lash – headwaters to conf with Loughor river' waterbody (WFD Ref: GB110059032121).

The proposed flood alleviation scheme lies above the Carmarthen Carboniferous Coal Measures groundwater waterbody (WFD Ref: GB4100G200600).

NRW has published River Basin Management Plans (RBMPs) that set out the measures through which compliance with WFD objectives will be achieved. The Ammanford Flood Alleviation Scheme, and all the waterbodies assessed within this WFD assessment, lie within the Western Wales RBMP.

2.2 Loughor – headwaters to confluence with Marlas river waterbody

The Loughor – headwaters to confluence with Marlas river waterbody stretches from its source in the foothills of the Brecon Beacons (Grid Reference SN 68842 17772), to the confluence with the River Marlas at Pantyffynnon (SN 62241 10595).

The waterbody is currently assessed as having an overall status of moderate, a chemical status of fail and an ecological status of good. The quality element that is driving the failing chemical status and the overall moderate status is elevated levels of nonylphenol, a Chemical listed under Annex 10.

Table 2-1: Summary of the WFD status of Loughor – headwaters to confluence with Marlas river waterbody

Waterbody criteria	RBMP Cycle 2 Interim Classification (2018)
Overall Waterbody Status	Moderate (Objective – Good by 2027)
Ecological Status	Good (Objective – Good by 2015)
Chemical Status	Fail (Objective – Good by 2027)
Biological Elements	
AWIC	High
Fish	Good
Invertebrates	High
Macrophytes and phytobenthos combined	Good
Macrophyte sub-element	High
Phytobenthos sub-element	Good
Hydromorphological Elements	
Hydrological Regime	High
Morphology	Good
Physico-chemical Elements	
Ammonia	High
Dissolved Oxygen	High
pH	High
Phosphate	High
Temperature	High
Annex 8 Chemicals	High
Chemical Elements	
Copper	High
Priority Hazardous Substances	Moderate
Nonylphenol	Moderate
Priority Chemicals	High

1,2-dichloromethane	High
Benzene	High
Dichloromethane	High
Trichloromethane	High
Other Chemicals	High
Carbon tetrachloride	High
DDT	High
Para-para DDT	High

(N.B. Annex 8 chemicals refer to 'specific pollutants' and Annex 10 substances refer to 'priority substances')

The 'Reasons for Not Achieving Good Cycle 2 Data' document on Water Watch Wales website identifies the following reason why the waterbody has failed to achieve Good overall status:

- Organic pollution from a diffuse source, likely sewage discharge.
- Organic pollution from farm infrastructure
- Nonylphenol pollution from an unknown source (pending investigation).

2.3 Marlas – headwaters to confluence with Loughor river waterbody

The Marlas – headwaters to confluence with Loughor river waterbody stretches from its source near Llyntweg (SN 56949 17784) to its confluence with the River Loughor at northern Ammanford (SN 62282 13332).

The waterbody currently has an overall status of Moderate, an Ecological status of Moderate and a Chemical Status of Good. The driving ecological quality element is phosphate.

Table 2-2: Summary of the WFD status of Marlas – headwaters to confluence with Loughor river waterbody

Waterbody criteria	RBMP Cycle 2 Interim Classification (2018)
Overall Waterbody Status	Good (Objective – Good by 2027)
Ecological Status	Good (Objective – Good by 2027)
Chemical Status	Good (Objective – Good by 2015)
Biological Elements	
Fish	High
Macrophytes and phytobenthos combined	High
Macrophyte sub-element	High
Hydromorphological Elements	
Hydrological Regime	High
Morphology	Good
Physico-chemical Elements	
Ammonia	High
Dissolved Oxygen	High
pH	High
Phosphate	High
Temperature	High
Chemical Elements	
Priority Hazarodus Substances	Not Assessed
Priority Chemicals	Not Assessed
Other Chemicals	Not Assessed

(N.B. Annex 8 chemicals refer to 'specific pollutants' and Annex 10 substances refer to 'priority substances')

The 'Reasons for Not Achieving Good Cycle 2 Data' document on Water Watch Wales website identifies the following reason why the waterbody has failed to achieve Good overall status:

- Phosphate pollution, unknown source (pending investigation).

2.4 The Lash – headwaters to confluence with Loughor river waterbody

The Lash – headwaters to confluence with Loughor waterbody stretches from its source north of Blaenau (SN 60145 14156) to its confluence with the River Loughor in northern Ammanford (SN 62177 13233). The waterbody is designated as a Heavily Modified Waterbody (HMWB) due to actions associated with land drainage.

The waterbody currently has an Overall Status of Moderate, with an Ecological Status of Good and a Chemical Status of Moderate. The driving ecological quality element is Mitigation Measures Assessment (an assessment of the actions that need to be in place to ensure that HMWBs achieve 'Good Ecological Potential).

Table 2-3: Summary of the WFD status of The Lash – headwaters to confluence with Loughor waterbody

Waterbody criteria	RBMP Cycle 2 Interim Classification (2018)
Overall Waterbody Status	Moderate (Objective – Good by 2021)
Ecological Status	Moderate (Objective – Good by 2021)
Chemical Status	Good (Objective – Good by 2015)
Mitigation Measures Assessment	Moderate
Biological Elements	
Fish	Good
Invertebrates	Good
Macrophytes and phytobenthos combined	High
Macrophyte sub element	High
Phytobenthos sub element	High
Hydromorphological Elements	
Hydrological Regime	High
Physico-chemical Elements	
Ammonia	High
Dissolved Oxygen	High
pH	High
Phosphate	High
Temperature	High
Annex 8 Chemicals	Not Assessed
Chemical Elements	
Priority Hazarodus Substances	Not Assessed
Priority Chemicals	Not Assessed
Other Chemicals	Not Assessed

(N.B. Annex 8 chemicals refer to 'specific pollutants' and Annex 10 substances refer to 'priority substances')

Mitigation measures have been identified within the RBMP to enable the waterbody to achieve its WFD objectives. These mitigation measures (and their status) are:

Table 2-4: Mitigation Measures assessment for The Lash – headwaters to confluence with Loughor waterbody

Mitigation Measure Tier 1	Mitigation Measure Tier 2	Measure Status
Education	Educate landowners	Not in place – not yet identified
Operations and maintenance	Selective vegetation control	
	Vegetation control	
	Vegetation control timing	
	Invasive species techniques	
	Retain habitats	
	Sediment management strategy	
	Maintenance – minimise habitat impact	
	Maintenance – prevent sediment transfer	
	Water level management	
Structural modification	Fish passes	
	Reduce fish entrainment	
	Enhance ecology	
	Changes to locks etc	
Water Management	Align and attenuate flow	
Working with physical form and function	Flood bunds	
	Set-back enhancements	
	Floodplain connectivity	
	Remove obsolete structure	
	Remove or soften hard bank	
	Preserve or restore habitats	
	In-channel morph diversity	
	Re-opening culverts	
	Alter culvert channel bed	

2.5 Carmarthen Carboniferous Coal Measures groundwater waterbody

Carmarthen Carboniferous Coal Measures groundwater waterbody stretches from Pembrey in the west to Swansea in the east, and from Llandybie in the north to the south Wales coast.

The waterbody has a chemical status of 'Poor' and a quantitative status of 'Good', giving it an overall status of 'Poor'. The potential for the proposed scheme to impact upon the waterbody is considered in section 3.

The 'Reasons for Not Achieving Good Cycle 2 Data' document on the Water Watch Wales website describes the following reasons why the waterbody has not achieved 'Good' status:

- Point source pollution from abandoned mines; and
- Point source pollution from an unknown source.

2.6 WFD Protected Areas

There are no WFD Protected Areas within 2km of the proposed scheme. The closest WFD Protected Area is Caeau Mynydd Mawr Special Area of Conservation (SAC), located approximately 4.1km to the west.

3 Scoping Assessment

3.1 Loughor – headwaters to confluence with Marlas river waterbody

Table 3-1 identifies the potential risks associated with the proposed scheme and the WFD receptors that are at risk i.e., those risks that require a Detailed Compliance Assessment.

Table 3-1: Preliminary WFD Assessment for the Loughor – headwaters to confluence with Marlas river waterbody

Loughor – headwaters to confluence with Marlas waterbody	
Hydro-morphological	**Construction phase** During construction, vegetation will be removed and earth exposed; this has the potential to input fine sediment into the river system which, if excessive, could lead to in-channel siltation either locally or downstream and localised reduction in water quality. However, good construction practices can be implemented to limit exposure and transfer of fine sediment between the banks and the channel. This can include measures to ensure that exposed earth is not left exposed adjacent to the river during heavy rainfall events, as overland flows would entrain fine sediment and input it into the river system. A Construction Environmental Management Plan (CEMP) will be prepared. This will include a range of controls to minimise the risk of adverse impacts on hydromorphological conditions during construction. Construction of the flood defence walls and embankments will not involve works inside the channel of the waterbody. However, removal of riparian vegetation upstream and downstream of the Station Road bridge could cause localised destabilisation of the riverbanks, which could lead to increased bank erosion. Given the scale of vegetation removal proposed, any impacts on the river channel are likely to be small-scale and therefore are not likely to have more than a localised effect on the hydromorphological regime. This risk can be further mitigated through replanting of riparian vegetation during the construction phase. Removal of the gravel bar under the A483 Llandybie Road bridge has the potential to change the local gradient of the river and may lead to hydromorphological change in that reach. By removing a gravel bar feature, there is a risk that sediment in transport that would usually be carried downstream during higher flows, would preferentially be deposited at the location where gravel is removed, thereby potentially starving features downstream. The sediment transport equilibrium would be temporarily imbalanced following gravel removal. However, provided only small-scale gravel removal is proposed, this impact is not likely to be significant. **Operational phase** Periodic removal (every 5 to 10 years) of the gravel bar beneath the A483 road bridge will continue to have a localised impact on channel gradient and sediment transport regime. However, any such effects will be very limited in scale and are not likely to be significant. Modification of the banks upstream and downstream of Station Road bridge could reduce the stability of the bank for a period of time after construction, which increases the risk of bank erosion, especially during high flows when erosive energies are greater. Where the flood walls and embankments are proposed adjacent to the river (Tir-y-Dail and upstream and downstream of Station Road bridge), the channel and its floodplain will be disconnected locally. This has the potential to increase erosive energies in-channel, by preventing the dissipation of flood energy across the floodplain. This has the potential to cause elevated erosion rates during high flow events, which could either initiate erosion of the banks (either locally or immediately downstream) or the bed substrate. However, high channel incision throughout this stretch of the waterbody has already caused a degree of disconnect between the channel and floodplain (as

	identified by a Hydromorphological Walkover Survey – see JBA Consulting, 2019a) and much of the floodplain affected by the proposed scheme is already highly compromised by urban development. **Assessment outcome** Given the limited scale of the proposed works, no significant impacts on the hydromorphological quality elements are anticipated. No change in waterbody status is likely and the proposed scheme will not inhibit these quality elements from achieving or maintaining their status objectives.
Biological	**Construction phase** A Preliminary Ecological Appraisal (PEA) of the scheme area (see JBA Consulting, 2018) identified that migratory fish species including salmonid species and Eel *(Anguilla anguilla)* have been recorded in the waterbody. Construction works in close proximity to the river channel have the potential to cause water contamination due to the release of silt or construction materials as well as increase noise, light and vibration disturbance. However, given the limited scale of the proposed works, any such risks can be effectively managed through application of good construction practices and implementation of appropriate environmental management measures through a CEMP. Construction work within the channel to remove the gravel bar underneath the A483 Llandybie Road bridge, could cause the release of silt or sediment, which could affect fish species, invertebrates and macrophytes through disturbance or smothering of channel substrate. All such works should be undertaken in dry working conditions as far as is practicable to limit the potential for silt/sediment mobilisation. In addition, such works should be undertaken outside of the fish migratory period (typically October to March inclusive, but local timings should be confirmed with the NRW Fisheries Team). As such, any impacts associated with gravel removal are not likely to be significant. Notwithstanding this, it is recommended that opportunities to provide benefits to aquatic and riparian species, including improvements to fish passage, are incorporated into the proposed scheme (see JBA Consulting, 2019). **Operational phase** Periodic removal of the gravel bar beneath the A483 road bridge could have an impact on the aquatic ecology of the waterbody. However, assuming such works are limited to the extent of the road bridge and are undertaken during low-flow conditions and outside of the fish migration period, any such effects will be limited in scale and are not likely to be significant. **Assessment outcome** The works in the river channel are likely to be small in scale and should not have a significant effect on fish species or other aquatic ecology provided that they are timed to avoid the salmonid migration period and robust environmental management controls are adopted throughout construction (as set out in a CEMP) to limit the potential for silt/sediment mobilisation. As such, no change in waterbody status is likely and the proposed scheme will not inhibit the biological quality elements from achieving or maintaining their status objectives. It is recommended that opportunities to provide benefits to aquatic and riparian species are incorporated into the proposed scheme.

Physico-chemical and chemical	**Construction phase** Construction works within and close to the river channel have the potential to cause the release of silt/sediment and other construction materials e.g., fuels and concrete, which could have an adverse effect on physico-chemical and chemical water quality conditions in the waterbody (with indirect effects on aquatic ecology). However, it is unlikely that any sediment disturbed during construction would contain significant contaminants (exceeding Cefas Action Level 1) and no discharge of materials to the waterbody are proposed. Therefore, risks during the construction phase can be effectively managed through the adoption of a robust CEMP, which would set out the environmental management controls to be adopted throughout construction. **Operational phase** It is not anticipated that there would be any operational impacts upon the physico-chemical quality elements. **Assessment outcome** Given the nature and limited scale of the proposed works, no significant impacts on physico-chemical and chemical quality elements are anticipated. No change in waterbody status is likely and the proposed scheme will not inhibit these quality elements from achieving or maintaining their status objectives.
Protected Areas	There are no WFD protected areas within 2km of the proposed scheme. As such, no impacts are anticipated on WFD protected areas as a result of the proposed development.
Priority habitats	The PEA of the proposed scheme (JBA Consulting, 2018) identified the following Priority Habitats in the scheme area: • Wet woodland • Hedgerow • Rivers **Construction phase** Riparian tree removal (50+ trees) is required to facilitate construction of the scheme. This will have a localised effect on tree cover and could lead to a break in the existing riparian tree line. It is therefore recommended that mitigation tree planting is undertaken to restore tree riparian tree cover and ensure no net loss of trees. The scheme involves construction of flood defence walls and embankments close to the river channel, as well as small-scale gravel shoal removal beneath the A483 road bridge. However, the works proposed are limited in extent and reinstatement works, including the seeding of all works areas, will mitigate any temporary impacts during construction. Notwithstanding this, it is recommended that opportunities to provide benefits to aquatic and riparian species are incorporated into the proposed scheme. **Operational phase** Providing appropriate planting is undertaken to mitigate the loss of trees and other riparian vegetation lost during construction, to maintain riparian habitat connectivity, it is not anticipated that there would be any operational impacts upon Priority Habitats. **Assessment outcome** Providing appropriate mitigation planting is provided, no significant impacts on Priority Habitats are anticipated.
Invasive non-native species	**Construction phase** • The PEA (JBA Consulting, 2018) identified well-established populations of Himalayan Balsam *(Impatiens glandulifera)* and

	Japanese Knotweed *(Fallopia japonica)* along the banks of this waterbody in the scheme area. Construction works therefore have the potential to cause the spread of these species. However, implementation of good construction practices and the preparation of an Invasive Species Management Plan, containing control measures to be adopted to minimise the risk of spread of these species, will limit the risk of any such impacts. This Plan should include the following measures as a minimum: Mapping of the extent of all INNS, with clear demarcation of affected areas and access to these areas strictly limited and supervised. • Wheel washing facilities should be used by the contractor to clean wheels of vehicles entering or leaving the site. • Check, clean and dry protocols should be employed. • Any Himalayan Balsam or Japanese Knotweed contaminated materials excavated as a result of the works should be contained and transported off site by a licensed waste carrier. **Operational phase** It is not anticipated that there would be any operational impacts upon INNS. **Assessment outcome** Provided that appropriate measures are adopted during construction, no impacts from INNS are anticipated.

3.2 Marlas – headwaters to confluence with Loughor river waterbody

The proposed development does not include any new flood defences along this waterbody, which is predominantly upstream of the proposed works. Given the scale and nature of the proposed scheme, which includes only very limited and temporary in-channel works and will not create any permanent physical modifications to, or barriers within, the channel, no significant impacts on the Marlas – headwaters to confluence with Loughor river waterbody are anticipated. No change in waterbody status is likely and the proposed scheme will not inhibit the waterbody from achieving or maintaining its status objectives.

3.3 Lash – headwater to confluence with Loughor river waterbody

As with the Marlas – headwaters to confluence with Loughor river waterbody, no defences are proposed along the Lash – headwater to confluence with Loughor river waterbody, which is again predominantly located upstream of the proposed works. Given the scale and nature of the proposed scheme, no significant impacts are anticipated. No change in waterbody status is likely and the proposed scheme will not inhibit the waterbody from achieving or maintaining its status objectives.

3.4 Carmarthen Carboniferous Coal Measures groundwater waterbody

The proposed works will not use chemicals, during either construction or operation, that could impact upon the chemical status of the groundwater waterbody. In addition, the proposed works would not be intrusive (significant excavations or piling works) and so no new pathway to groundwater will be created and no groundwater dewatering is likely to occur.

Given the nature and limited scale of the proposed works, no significant impacts on the groundwater body are anticipated. No change in waterbody status is likely and the proposed scheme will not inhibit the waterbody from achieving or maintaining its status objectives.

4 Conclusion and recommendations

No adverse impacts on any WFD waterbodies are anticipated. There is a risk that the Loughor – headwaters to confluence with Marlas river waterbody (WFD Ref: GB110059032130) could experience some small-scale adverse impacts during

construction, but these risks can be effectively managed through the application of good construction practices and robust environmental management (as set out in a project specific CEMP) and through appropriate mitigation tree and vegetation planting. Therefore, no further assessment is required at this stage.

No impacts on the Carmarthen Carboniferous Coal Measures groundwater waterbody (WFD Ref: GB41002G200600) are anticipated. Therefore, there is also no further assessment required at this stage.

4.1 Consultation

It is recommended that consultation with the NRW Fisheries team is undertaken in relation to the following:

- Confirming local timings of seasonal in-channel working restrictions.
- Further assessing the potential for improvement of fish passage at the gauging station weir to the south of Station Road bridge.

4.2 Pollution prevention measures

This assessment has confirmed that there is the potential for adverse impacts to the biological and chemical quality of the Loughor – headwaters to confluence with Marlas river waterbody during construction. The risk of this can be prevented through recognised good construction practices. These good construction practices can be enforced with the creation of a CEMP for the scheme, to be agreed with NRW. If measures described in the CEMP are put into practice, the risks of adverse consequences to the waterbody can be eliminated.

As a minimum, the following mitigation measures should be followed throughout construction:

- Abiding by relevant pollution prevention measures e.g. CIRIA Guidance: Control of water pollution from construction sites.
- Construction staff working on site and site visitors should be given toolbox talks on the potential for encountering protected species and pollution risks associated with working near water. Information useful for Toolbox Talks on this subject can be found at: https://www.ciria.org/Resources/All_toolbox_talks/Env_toolbox_talks/Working_on_or_near_watercourses.aspx
- Preventing accidental oil and fuel leaks can be achieved by the following actions:
    - Any chemical, fuel and oil stores should be located on impervious bases within a secured bund with a storage capacity 110% of the stored volume.
    - Biodegradable fuels and oils should be used where possible.
    - Drip trays should be placed underneath any standing machinery to prevent pollution by oil/fuel leaks. Where practicable, refuelling of vehicles should be carried out on an impermeable surface in one designated area well away from any watercourse or drainage (at least 10m).
    - Emergency spill kits should be available on site and all staff trained in their use.
    - Operators should check their plant daily before starting work to confirm the absence of leakages. Any leakages should be reported immediately.
    - Daily checks should be carried out and records kept on a weekly basis and any items that have been repaired, replaced or rejected should be recorded.

4.3 Biosecurity

Good biosecurity practices are essential for preventing the spread of INNS and waterborne pathogens. Measures should be adopted so that construction activities do not lead to the spread of INNS or pathogens. Biosecurity measures should include, but not be limited to:

- All site personnel and visitors should be inducted in good biosecurity practices. The should include adoption of the Check-Clean-Dry campaign.
- The Check-Clean-Dry poster should he displayed in the site office as a reminder of good biosecurity practices: http://www.nonnativespecies.org/downloadDocument.cfm?id=608.
- All equipment, tools, vehicles and Personal Protective Equipment (PPE) used on site should be checked for seeds originating from any identified INNS before leaving the area. If seeds from invasive species are identified, the items should be cleaned and removed seeds should be destroyed.
- Under no circumstances should soils with the potential to contain seeds from identified invasive species leave the site except to a waste handler able to receive this type of waste. Any earth movements within areas containing identified invasive species should be minimised where possible.
- The spread of waterborne diseases should be limited through the adoption of the Check-Clean-Dry campaign. This would entail all machinery and PPE being appropriately disinfected prior to it entering site and upon leaving site. Following application od a suitable disinfectant, machinery and PPE should be allowed to fully dry for at least 72 hours before being used on another aquatic site.

4.4 Enhancements

It is recommended that opportunities to provide additional environmental enhancements are considered through this scheme. A range of opportunities have identified in the ECOR report for the scheme (JBA Consulting, 2019b).

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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Appendix B

Ammanford Flood Defence Scheme Keyplan

N

PARC HENRY LANE FLOOD BUND
- 272967-ARP-PH-XX-DR-PL-0101

BONLLWYN FARM FLOOD WALL
- 272967-ARP-BF-XX-DR-PL-0104

BONLLWYN FLOOD WALL
- 272967-ARP-BO-XX-DR-PL-0102

BONLLWYN FARM LANDSCAPE PLANTING
- 272967-ARP-BF-XX-DR-PL-0104

RAILWAY BRIDGE FLOOD WALL
- 272967-ARP-RB-XX-DR-PL-0105

A438 FLOW DEFLECTOR AND ACCESS RAMP
- 272967-ARP-FD-XX-DR-PL-0103

BONLLWYN GREEN LANDSCAPING PLAN
- 272967-ARP-BG-XX-DR-PL-0203

TIR Y DAIL FLOOD BUND
- 272967-ARP-TD-XX-DR-PL-0106

SHANDS RD FLOOD WALL
- 272967-ARP-SR-XX-DR-PL-0107

HEOL HAYDN FLOOD WALL
- 272967-ARP-HH-XX-DR-PL-0108

SHANDS RD LANDSCAPE PLANTING
- 272967-ARP-SR-XX-DR-PL-0201

COLEG SIR GAR FLOOD WALL
- 272967-ARP-CG-XX-DR-PL-0109

TIR Y DAIL WEIR
- 272967-ARP-CG-XX-DR-PL-0110
- 272967-ARP-CG-XX-DR-PL-0111
- 272967-ARP-CG-XX-DR-PL-0112

NOTES:

KEY:

NATURAL RESOURCES WALES LAND OWNERSHIP

APPLICATION SITE BOUNDARY
(FOR APPLICATION AREAS REFER TO DRAWINGS 272967-ARP-XX-XX-DR-PL-0002 TO 006).

0 10 20 30 40 50 100 Metres
Scale 1:2500

Rev.	Description	Drawn	Chkd	Appd	Issue Date
P2	SURVEY AREAS UPDATED	SS	JL	RC	xx.xx.xx
P1	FOR PLANNING	SS	JL	RC	14.10.20

Cyfoeth Naturiol Cymru Natural Resources Wales

ARUP

Project Name.
AMMANFORD FLOOD RISK MANAGEMENT SCHEME

Drawing Title.
SITE LOCATION AND KEY PLAN

Suitability.	Suitability Code.
FOR PLANNING	S2
Internal Project Number. 272967-00	Scale. 1:2500 / Rev. P2

Drawing Number.
272967-ARP-XX-XX-DR-PL-0001

DRAFT

A1

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