



Natural Resources Wales

ABBEY CONSOLS

Habitats Regulation Assessment: Information to Inform an Appropriate Assessment



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EXECUTIVE SUMMARY

Natural Resources Wales (NRW) has appointed WSP UK Ltd to design remediation works at the Abbey Consols mine site, hereafter referred to as 'The Project'. The Project is located at Strata Florida, Ystrad Fflur, Ceredigion and on grid reference SN 7430066115 and is approximately 5.9 hectares in size.

This report is an assessment of potential adverse effects on integrity of European Site as a result of the proposed remediation works taking into account proposed mitigation at Abbey Consols in accordance with the Conservation and Habitats Regulations 2017 (as amended), (hereafter referred to as the Habitats Regulations).

Abbey Consols Mine has been selected to undergo remediation works to improve the water quality of the River Teifi (Afon Teifi) under the Water Framework Directive (WFD). Metal mine sites in Britain present significant sources of water pollution. Investigations carried out to date confirmed that Abbey Consols is a major source of zinc and lead to the River Teifi, which is failing to achieve WFD standards for zinc over at least 14 km of river, including two separate WFD water bodies.

The Project is located adjacent to the River Teifi Special Area of Conservation (SAC), 1.9 km west of the Elenydd-Mallaen Special Protection Area (SPA) and 2.82 km east of the Cors Caron SAC and Ramsar. Due to the proximity of the River Teifi SAC the Project requires assessment in accordance with the Habitats Regulations.

In the absence of mitigation, potential for impacts on the adjacent River Teifi SAC have been identified at Stage 1 screening. The Stage 1 screening assessment concluded that in the absence of mitigation, potential for impacts on the adjacent River Teifi SAC have been identified (through hydrological and disturbance impact pathways). This could result in a temporary / short-term effect to vegetation communities of Annex I habitat and Annex II species (Atlantic salmon (*Salmo salar*); brook lamprey (*Lampetra planeri*); river lamprey (*Lampetra fluviatilis*); bullhead (*Cottus gobio*); and otter (*Lutra lutra*)) during works. Potential effects on sea lamprey (*Petromyzon marinus*) have been screened out.

No pathways or Likely Significant Effects (LSE) has been identified in relation to the Elenydd-Mallaen SPA or Cors Caron SAC and Ramsar and these sites will not be considered further.

No other plans or projects have been found that require consideration for in-combination effects.

Stage 2 appropriate assessment took account of appropriate mitigation measures which includes the following:

- § Production and implementation of Environmental Action Plan (EAP);
- § Specific/Targeted mitigation measures such as the restriction of all bankside operations within 50 m of River Teifi to within a seasonal window (July – September), to avoid or minimise the impacts of disturbance on Annex II fish species using the River Teifi;
- § Avoidance of night time works (including the need for lighting) and provision of fencing and covering excavations to avoid disrupting movement of otter along the River Teifi; and



§ Implement timing of works, construction methods and relevant pollution prevention controls (including good silt and water management) to prevent increased sediment and metal contaminant load.

The Project (alone or in combination with other plans or projects) is considered unlikely to adversely affect the integrity, structure and function of the qualifying features within the River Teifi SAC, provided the appropriate mitigation measures are implemented and adhered to throughout the works and that environmental mitigation strategies are implemented as specified. As such, it is considered that the Project can proceed without the requirement for further assessment under the Habitats Regulations.

1. INTRODUCTION

- 1.1.1. This Report to Inform an Appropriate Assessment (AA) has been prepared by WSP on behalf of Natural Resources Wales (NRW). The report has been produced with regard to Regulations 27 to 30 and 32 to 37 of the Conservation of Habitats and Species Regulations 2017 in implementing Article 6(3) of the European Community Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive).
- 1.1.2. Investigations carried out to date confirmed that Abbey Consols is a major source of zinc and lead to the River Teifi (Afon Teifi), which is failing to achieve Water Framework Directive (WFD) standards for zinc in at least 14 km of river, including two separate WFD water bodies. Remediation works will encompass diverting water away from waste arising from mine workings and arrangement of the site water management system so that clean water is separated from dirty water before being discharged into the River Teifi.
- 1.1.3. The works are currently planned to take place over the autumn 2020 / winter 2021. However, this date is subject to review on completion of the Habitats Regulations Assessment (HRA) and liaison with NRW over avoidance of works in sensitive timing periods that may inform the mitigation for the Project.
- 1.1.4. The remediation works described above are hereafter referred to as the 'Project'. A Project description and associated ecological baseline assessments to inform the development is provided in Section 2. The Project is centred on grid reference SN 7430066115. Survey reports relevant to the HRA are included in Appendices A - C.
- 1.1.5. This HRA considers the potential for adverse effects on integrity resulting from the Project, upon European Sites.
- 1.1.6. The definition of 'European Site' comprises sites designated as any of the following:
- § Special Area of Conservation (SAC) or candidate SAC (cSAC);
 - § Special Protection Area (SPA) or potential SPA (pSPA); or
 - § Wetland of International Importance (Ramsar site) – as a matter of UK government policy.
- 1.1.7. This report provides information to enable the Competent Authority to complete Stage 2; Appropriate Assessment (AA), based on the conclusions of the HRA Stage 1; Screening (WSP, October 2019) of the Project.
- 1.1.8. The methodology for the HRA, for which this report discusses Stage 2 AA of the Project, is set out in Section 3.
- 1.1.9. The identified designated site is provided in Section 4 whilst a summary of the consideration of potential effects of the Project upon the designated site (including in-combination effects) and whether these are likely to be significant is provided in Section 5. Where Likely Significant Effects (LSE) are identified, these are addressed under AA within Section 6.

2. PROJECT DESCRIPTION

- 2.1.1. The location of the Project is Strata Florida, Ystrad Fflur, Ceredigion. The Project is centred on grid reference SN 74300661 15 and is approximately 5.9 hectares in size; as shown on Figure 1 - Site Location Plan.
- 2.1.2. Review of previous studies and site data obtained during the 2019 Ground Investigation showed that eliminating the contact between mine waste material and water (rainfall and groundwater) is fundamental to the successful mitigation of impacts on the River Teifi water quality (WSP, 2019). This is likely to be achieved through the processes listed below (Figure 2– General Arrangement Plan), however some of the following may be subject to change and will be confirmed at detailed design stage:
- § Consolidation of waste material on site and installation of an engineered cap to avoid percolation of rainfall through mine waste;
 - § Installation of a surface run-off drainage system to divert rainfall from the capped areas directly to the river;
 - § Installation of groundwater drainage to mitigate potential groundwater table rise into the bottom zone of the waste material and to protect the mine water treatment lagoons from groundwater uplift;
 - § Installation of a shallow clay wall to reduce hydraulic connectivity between the marshy area in the north-western part of the site and the waste tips;
 - § Isolation of adit discharge from groundwater and waste material by installation of an adit discharge capture structure next to the adit entrance;
 - § Development of the main clean water discharge route along the eastern site boundary with the construction of a new discharge point into the River Teifi (Figure 3).
 - § Captured mine water will be carried from the adit mouth via below ground pipework approximately to the current discharge pipe location under the access road and then runs in a southerly direction in an open channel (similar to the current ditch) towards the treatment area located within the south-eastern part of the current waste tips/former treatment area;
 - § Treatability trials undertaken in the laboratory and on site suggest that the mine water can be cost-effectively treated via dosing with sodium carbonate (limestone gravel) forming a zinc carbonate precipitate. The proposed large-scale field trial elements have three main features, i.e. a lagoon, a limestone bed and a Vertical Flow Reactor. The lagoon and the limestone bed allow to test a range of configuration to explore optimum limestone contact times and precipitate settlement times. The Vertical Flow Reactor allows vertical filtration/drainage through gravel. It can be used as post-treatment or standalone treatment and allows for chemical dosing (iron, manganese or carbonate sources) to enhance metal removal. Each of these treatment elements is sized based on an assumed mine water flow of 1l/s. Comprehensive testing and monitoring of the treatment processes will be undertaken at field trial stage to optimise the treatment configuration later on.
- 2.1.3. The proposed designs have been developed under close liaison with environmental and Health and Safety (H&S) disciplines, to maximise opportunities for the creation of additional benefits, and to allow safe construction and operation.
- 2.1.4. The drainage outfall will be constructed first, and this will not be utilised until the main works have been completed. The design of the proposed outfall is shown in Figure 3.

- 2.1.5. The Project will include ground works and the removal of vegetation. All arisings will be retained on site. Figure 4 – Phase 1 Habitat Survey map shows the habitats recorded on site during the Preliminary Ecological Appraisal that took place in 2018 (WSP, 2018). Figure 5 - Capping and Drainage layout indicates the habitats that will be removed due to capping, spoil excavation and the proposed treatment area. A basic summary of works will involve the southern section of the site being removed and reinstated, with contaminated material moved to the north and reprofiled with cover material.
- 2.1.6. The machinery to be used for the remediation works are detailed below:
- § Hydrological excavators;
 - § JCB type machine;
 - § Site dumpers;
 - § Rollers for compacting; and
 - § Potentially a hydraulic breaker for hard rock.
- 2.1.7. On completion, the site will be planted with a nurse crop and temporary impermeable cover of the re-instated/capped areas will be considered (if necessary) to avoid soil erosion immediately after construction. This will be combined with specific habitat enhancement measures to increase the biodiversity value of the site.

2.2. ECOLOGICAL BASELINE ASSESSMENT

- 2.2.1. The site has been subject to a variety of ecological surveys, which aimed to provide a baseline assessment and to confirm the presence or likely absence of protected species, habitats and flora to inform the Project.

RELEVANT SITE-SPECIFIC SURVEYS

- 2.2.2. A summary of site-specific survey data relevant to the HRA is provided below.
- 2.2.3. The associated survey reports are included in Appendix A (Preliminary Ecological Appraisal, WSP, May 2018), Appendix B (Ecological Appraisal Report, Abbey Consols Mine Pontrhydfendigaid Ceredigion, NRW, September 2018), Appendix C (Aquatic Habitat Survey, WSP, April 2020).

Preliminary Ecological Appraisal

- 2.2.4. A Preliminary Ecological Appraisal of the site was carried out in May 2018 (WSP, May 2018). The field survey recorded suitable habitat for badger *Meles meles* and otter *Lutra lutra* on Site. Suitable habitat for supporting bats, birds, reptiles, invertebrates, fish and lower plants were also identified.

ECOLOGICAL APPRAISAL REPORT

Otter Survey

- 2.2.5. An otter survey was undertaken by NRW in September 2018 as part of an ecological appraisal (NRW, September 2018), this field survey was undertaken prior to the creation of the two outfall options. The survey area covered a total of 750m of riparian habitat. The survey area covers an area 500m upstream and 250m downstream of the proposed outfall location.
- 2.2.6. Field signs of otter were found both upstream and downstream of the proposed outfall location, signs included:



- § Spraint - found along the length of the study area with fresh spraint within 100m of the proposed outfall.
- § Resting places – found upstream and downstream of the proposed outfall, in excess of 100m.

- 2.2.7. Suitable habitat – three sites found both upstream and downstream of the proposed outfall, in excess of 100m. Livestock were noted in the fields adjacent to the northern banks, with bankside habitat being more open and subject to grazing, creating less sheltered habitat for otter.
- 2.2.8. The report concluded the middle and upper reaches of the study area (upstream of the proposed outfall) were subject to regular use by otters for foraging and commuting, with less field signs in the lower reaches.

Abbey Consols Ecological Walkover Aquatic Survey

- 2.2.9. An aquatic survey was undertaken in April 2020 (WSP, April 2020) in order to assess the presence of suitable spawning habitat for the Annex II fish species in the Teifi SAC, a survey area of 250m was established, with the bankside location of Outfall B as the centre point. The survey found habitats of sufficient depth and substrate to accommodate spawning for all of the Annex II fish species present in the Teifi.

Otter Survey

- 2.2.10. As part of the aquatic survey undertaken in April 2020 a stretch of water 100m upstream and downstream of the proposed outfall (Option B) was undertaken. No field signs were identified at this time, it was noted that the northern banks of the Teifi in close proximity to the proposed outfall location (Option B) were heavily poached by livestock, potentially obscuring field signs.
- 2.2.11. The river condition and habitats present were functionally similar to those as described in the 2018 Ecological Appraisal Report and therefore it could be considered the River Teifi offers the same habitat resource for foraging and commuting otters.

3. HABITATS REGULATIONS ASSESSMENT PROCEDURE

3.1. INTRODUCTION

- 3.1.1. This section sets out the applicable methodologies and assumptions for the assessment of the Project with regards to the requirements of the Conservation of Habitats and Species Regulations 2017 (as amended).
- 3.1.2. Under the requirements of the European Council Directive 92/43/EEC 'The Habitats Directive' and the Council Directive 79/409/EEC 'The Wild Birds Directive' it is necessary to consider whether projects may have significant effects upon areas of nature conservation importance designated/classified under the Directives. This requirement is translated into UK law through the Conservation of Habitats and Species Regulations 2017 ('The Habitats Regulations'). The Habitats Regulations place a duty upon 'Competent Authorities' to consider the potential for effects upon sites of European importance prior to granting consent for projects or plans. Should LSE¹ be identified by the initial screening process it is necessary to further consider the effects by way of an 'AA'. Overall, this process of assessment is known as Habitats Regulations Assessment (HRA) and further details of the applicable legislative context are summarised within 3.2 below.

3.2. HABITATS REGULATIONS ASSESSMENT CONTEXT

LEGISLATIVE CONTEXT

- 3.2.1. Article 6 (3) of the European Union Habitats Directive (1992, as amended, 'the Habitats Directive') sets out the need for 'AA' of plans or projects which have potential to affect the integrity of a Natura 2000 site (including SPAs and SAC and cSAC sites such as those in proximity to the Project).
- § 'Any plan or project likely to have a significant effect on a Natura 2000 site, either individually or in combination with other plans or projects, shall undergo an AA to determine its implications for the site. The competent authorities can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site concerned' (Article 6.3).
- 3.2.2. As the purpose of the Natura 2000 Network is preservation of examples of species and habitats across Europe, rather than preservation of individual sites, Article 6 (4) allows for exceptional circumstances where negative effects may be permitted. This reads:
- § 'In exceptional circumstances, a plan or project may still be allowed to go ahead, in spite of a negative assessment, provided there are no alternative solutions and the plan or project is considered to be of overriding public interest². In such cases the

¹ A possible significant effect; one whose occurrence cannot be excluded on the basis of objective information (C-127/02).

² An exact definition of 'imperative reasons of overriding public interest' is not provided, but EC guidance states

Member State must take appropriate compensatory measures to ensure that the overall coherence of the Natura 2000 Network is protected.’ (Article 6.4).

3.2.3. The Habitats Directive is translated into UK law through the Conservation of Habitats and Species Regulations 2017 (as amended) (‘Habitats Regulations’); Regulation 63 (1) states that ‘A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which—

(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of that site,

— *must make an Appropriate Assessment of the implications for that site in view of that site’s conservation objectives.’*

Like the Habitats Directive, the Habitats Regulations also make allowance for projects or plans to be completed if they satisfy ‘imperative reasons of overriding public interest’³. Regulation 64 relates to such situations.

POLICY CONTEXT

3.2.4. It is a matter of Government policy (PPW paragraph 6.4.18 and 19) that sites designated under the 1971 Ramsar Convention for their internationally important wetlands (commonly known as Ramsar sites) and potential SPAs (pSPA) are also considered in the same way as SACs, SPAs and cSACs. As a matter of good practice, potential SACs (pSACs) should also be considered in the same way.

3.2.5. For the purpose of this report the range of sites identified above are considered under the grouped term ‘European sites’.

3.3. STAGES OF HABITATS REGULATIONS ASSESSMENT

3.3.1. Guidance on the Habitats Directive (European Commission, 2000) sets out the step wise approach which should be followed to enable Competent Authorities to discharge their

‘It is reasonable to consider that the “imperative reasons of overriding public interest, including those of social and economic nature” refer to situations where plans or projects envisaged prove to be indispensable:

- within the framework of actions or policies aiming to protect fundamental values for the citizens’ life (health, safety, environment);

- within the framework of fundamental policies for the State and the Society;

- within the framework of carrying out activities of economic or social nature, fulfilling specific obligations of public service.’

³ ‘(a) reasons relating to human health, public safety or beneficial consequences of primary importance to the environment; or.

(b) any other reasons which the competent authority, having due regard to the opinion of the European Commission, consider to be imperative reasons of overriding public interest.’

duties under the Habitats Directive and provides further clarity on the interpretation of Articles 6 (3) and 6 (4). The process used is usually summarised in four distinct stages of assessment.

- § Stage 1: Screening: the process which identifies whether effects upon European Sites of a plan or project are possible, either alone or in combination with other plans or projects and considers whether these effects are likely to be significant. Following the recent European Court of Justice case in *People Over Wind and Sweetman v Coillte Teoranta* (Case 323/17), All Stage 1 assessments must be undertaken without taking into account proposed mitigation measures intended on reducing or avoiding negative impacts of the Project on European sites.
- § Stage 2: AA: the detailed consideration of the effect on the integrity of the Natura 2000 site of the plan or project, either alone or in combination with other plans or projects, with respect to the site's conservation objectives and its structure and function.
- § Stage 3: Assessment of alternative solutions: the process which examines alternative ways of achieving the objectives of the plan or project that avoid adverse effects on the integrity of the Natura 2000 site.
- § Stage 4: Assessment where no alternative solutions exist and where adverse effects remain: an assessment of whether the development is necessary for imperative reasons of overriding public interest (IROPI) and, if so, of the compensatory measures needed to maintain the overall coherence of the Natura 2000 network.

3.3.2. The integrity of a site is defined as the coherence of the site's ecological structure and function, across the whole of its area, which enables it to sustain the habitat, complex of habitats and / or populations of species for which the site has been designated (EC, 2001). An adverse effect on integrity is likely to be one which prevents the site from making the same contribution to favourable conservation status as it did at the time of designation.

3.3.3. The precautionary principle is applied at all stages of the HRA process. In relation to Stage 1 Screening, this means that projects or plans where effects are considered likely and those where uncertainty exists as to whether effects are likely to be significant must be subject to Stage 2 of the HRA process; AA.

3.4. PURPOSE OF THIS REPORT

3.4.1. This report provides information to enable the AA. Where the potential for LSEs were identified in the Stage 1 Screening (WSP, October 2019) , the report then provides information to support an assessment of the potential for an adverse effect on the integrity of European Sites (Stage 2).

3.4.2. The methodology for Stage 2 of the HRA process is discussed further in section 3.5.

3.5. STAGE 2: APPROPRIATE ASSESSMENT

3.5.1. In accordance with the Habitats Regulations, AA is required when, in view of a European site's objectives, a project:

- § is likely to have a significant effect on a European site in Great Britain (either alone or in combination with other projects and/or plans); and
- § is not directly connected with or necessary to the management of the site.



- 3.5.2. Stage 2 considers LSE in greater detail, including consideration of mitigation measures where these may be applied to avert an effect on the integrity of the European sites concerned. If information is not sufficient to confirm that an adverse effect upon the site's integrity cannot be ruled out, then Stage 3 is undertaken to investigate alternative solutions.
- 3.5.3. The methods used to make such an assessment in Stage 2 depend on the nature of the likely effects, and the interest features, conservation objectives and conservation status of the site potentially affected. Section 4 below sets out European sites and qualifying features that have been screened in and out of further assessment in Stage 1, along with a justification for doing so.

4. RELEVANT DESIGNATED SITES

- 4.1.1. There are three designated European sites which have potential for source-pathway-receptor effects to be present and these lie within 10 km of the Project. The locations of these sites are shown on Figure 6 – European sites within 10 km of the Project. Only one of these sites fall within the potential zone of influence of the scheme (Zol). These European sites are:
- § River Teifi SAC (the Project lies immediately adjacent to the designated site with 3 m² of habitat currently anticipated to be directly affected by the Project through the construction of the outfall and further effects downstream of the works), considered within this AA;
 - § Elenydd-Mallaen SAC (4.07 km east) and SPA (1.9 km east), considered to be outside of the Zol; and
 - § Cors Caron SAC and Ramsar site (2.82 km west), considered to be outside of the Zol.
- 4.1.2. A full review of the European designated sites within 10 km of the Project, including qualifying habitats, species and justification from exclusion from this AA can be found in the Stage 1 Screening report (WSP, October 2019).

5. SCREENING OF POTENTIAL EFFECTS

5.1. SCREENING SUMMARY

5.1.1. The section below contains a summary of the screening report (WSP, October 2019), detailed findings of the Stage 1 Screening Assessment can be found in the original screening report.

ZONE OF INFLUENCE

5.1.2. The Zol is defined by the potential effects arising from the Project and the potential pathways for those effects to reach and affect qualifying features of European sites. Table 1 below details the Zol for potential effects (in the absence of mitigation) of the Project on European sites. This takes into account the very localised and short-term nature of the Project.

Table 1 - Potential Pathway between Cause and Effect

Effect	Cause	Ecological Receptor	Likely Zone of Influence
Habitat degradation	Pollution and contamination incidents associated with hydrological effects	River Teifi SAC Annex I habitat and Annex II species (fish and otters).	Within 2 km
Disturbance	Noise and vibration resulting from remediation works (e.g. pilling)	River Teifi SAC; Annex II species that are a primary reason for selection of this site (brook lamprey; river lamprey, Atlantic salmon, bullhead, otter). Annex II species present as a qualifying feature, but not a primary reason for site selection (sea lamprey).	50 m of works area (otter resting places or holts) ⁴

CONSIDERATION OF EFFECTS IN ISOLATION

5.1.3. The Project has been screened to identify whether potential effect pathways between the Project and the designated sites are present which are likely to result in significant effects upon the designated sites.

⁴ Based on European Protected Species licensing for disturbance for previous projects and professional judgement.

- 5.1.4. This exercise identified hydrological and disturbance pathways resulting from the Project which may result in significant effects upon the River Teifi SAC in the absence of mitigation and these are summarised in Table 2 below.

Table 2 - River Teifi SAC – Summary of screening of potential pathways for effects

Impact with the Potential to Result in a LSE	Qualifying Interest Feature	Reasoning	Conservation Objective	Likely Significant Effect (LSE)
<p>Habitat degradation (hydrological effects)</p>	<p>Annex I habitat and Annex II species</p>	<p>The remediation works will involve excavation, groundworks and soil movement, with machinery tracking through mine spoil during works. There is potential for silt and metals to be generated due to exposed soils and passed into the river, particularly during periods of rain.</p> <p>This could impact the ecological status of the water and the Annex I habitats and Annex II species supported by the watercourse.</p> <p>Annex II fish species (Atlantic salmon; brook lamprey; river lamprey and bullhead) are particularly sensitive to elevated levels of silt and fine particles during spawning which can interfere with egg and fry survival. Sea lamprey was screened out as the Afon Teifi SAC core management plan indicate that it is only present on the lower river and does not occur upstream of Llandysul, which is 45 km downstream of the Project.</p> <p>Annex I habitats vulnerable to hydrological effects include 3260 Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation and 831 Floating water-plantain <i>Luronium natans</i>.</p> <p>Localised erosion and introduction of silt during remediation works could damage water-crowfoot beds and lead to enrichment or pollution of the river.</p>	<p>Threats summarised from information within the Core Management Plan (2011) include diffuse pollution and siltation, localised erosion and introduction of silt which can damage water-crowfoot beds and can lead to enrichment or pollution of the river.</p> <p>Deterioration to water quality and / or increased suspended solids could also affect species of fish that are sensitive to elevated levels of fine particles during spawning.</p> <p>A hydrological effect pathway has been identified for Annex I habitats and Annex II species. Fish species are particularly sensitive during spawning to elevated levels of fine particles and damage water-crowfoot beds can result through enrichment.</p> <p>A LSE cannot be ruled out, through the generation of silt or other contaminants.</p>	<p>Yes (in the absence of mitigation)</p>

Impact with the Potential to Result in a LSE	Qualifying Interest Feature	Reasoning	Conservation Objective	Likely Significant Effect (LSE)
Disturbance of key species	Annex II species (fish)	<p>The River Teifi SAC is designated for supporting Annex II fish species (brook lamprey, river lamprey, Atlantic salmon, bullhead).</p> <p>Fish species are vulnerable to noise and vibration disturbance resulting from construction related activities. This may result from activities using heavy machinery such as excavators, rollers for compacting earth and the hydraulic breaker for hard rock during the 12-week works period.</p> <p>This could cause disturbance to fish populations migrating upstream and using spawning sites. A breakdown of sensitive periods for fish is provided below:</p> <ul style="list-style-type: none"> § Atlantic salmon; October to February. § Brook lamprey and river lamprey; March and May. § Bullhead; February and June. <p>An impact pathway has been identified through the disturbance of fish species, particularly during the sensitive migration period for spawning.</p>	<p>Conservation objectives for the SAC include all known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible.</p> <p>In the absence of mitigation, the Project could result in temporary, short-term disturbance to a qualifying species of the SAC during migration.</p> <p>A LSE cannot be ruled out.</p>	Yes (in the absence of mitigation)
Disturbance of key species	Annex II species (otter)	<p>The River Teifi SAC is designated for supporting the Annex II species otter.</p> <p>During an otter survey conducted by NRW (NRW, September 2018) significant signs of otter were noted throughout the surveyed reach (stretching from the footbridge at the</p>	<p>Conservation objectives for otters include measures to ensure the safe movement of otters around the catchment, and management should aim to ensure that there is sufficient undisturbed breeding habitat to support an otter</p>	Yes (in the absence of mitigation)

Impact with the Potential to Result in a LSE	Qualifying Interest Feature	Reasoning	Conservation Objective	Likely Significant Effect (LSE)
		<p>upstream end of the Project to a point some 270m downstream of the Project boundary). Signs of otter included footprints, spraints, runs and slides. Cavities, voids and undercuts were examined for their potential to act as resting or breeding sites.</p> <p>Fresh, recent and old spraint was recorded at nine separate locations indicate the River Teifi is well used at this location. One confirmed resting site and a number of potential sites were noted (NRW 2018). The majority of these features are upstream, with the closest potential resting site located >100m from the Project.</p> <p>Whilst no resting places were recorded within the Zol (for this assessment, the Zol is considered to be 50m for disturbance to result to an otter using a holt or resting place), noise and visual disturbance could disturb otters over a short-term, temporary period (worse-case scenario of approximately 12 weeks).</p> <p>Any excavations left open would also cause a risk to the safe movement of otters.</p> <p>A limited amount of bankside habitat will be disturbed during the construction of the outfall. Whilst this is not considered to affect the functionally linked habitat within the wider SAC, short-term disturbance could result to commuting otters.</p>	<p>population of a size determined by natural prey availability and associated territorial behaviour.</p> <p>The conservation objectives highlight where necessary, potentially harmful levels of disturbance must be managed.</p> <p>In the absence of mitigation, the Project could result in temporary, short-term disturbance to a qualifying species of the SAC.</p> <p>A LSE cannot be ruled out.</p>	

Impact with the Potential to Result in a LSE	Qualifying Interest Feature	Reasoning	Conservation Objective	Likely Significant Effect (LSE)
		Noise pollution associated with construction related activities such as excavation and rock breaking may deter otters from using the river in parts.		

POTENTIAL IN-COMBINATION EFFECTS

- 5.1.5. No other plans or projects that have the potential to interact with the LSEs noted above and could be considered in combination with the proposed Project are known.
- 5.1.6. The Project is therefore not likely to contribute towards any potential in-combination effects upon the European site considered in this screening.

SCREENING CONCLUSIONS

- 5.1.7. No pathways have been identified from the Project which are likely to result in a significant effect upon the Elenydd-Mallaen SAC and SPA or Cors Caron SAC and Ramsar. The ZOI from the Project will not extend to these sites, with no impacts likely to result from hydrology, dust, habitat fragmentation or disturbance to Annex II species. Therefore, these designated sites were scoped out from more detailed consideration within this report.
- 5.1.8. The Project lies adjacent to the River Teifi SAC. Whilst a small amount of direct habitat loss / modification will result, the Project will not result in any significant physical changes to the extent and / or distribution of natural habitats or aquatic plant communities, which are all qualifying features of this European site. The area of bankside habitat that will be affected to facilitate the outfall into the river does not qualify as Annex I habitat for which the site is designated.
- 5.1.9. In the absence of mitigation, potential for impacts on the adjacent River Teifi SAC have been identified (through hydrological and disturbance impact pathways). This could result in a temporary / short-term effect to vegetation communities of Annex I habitat and Annex II species (otters and fish) during works.

6. APPROPRIATE ASSESSMENT

6.1. APPROACH

- 6.1.1. This AA section considers the potential effects identified during screening (Section 5) in more detail in terms of their nature and extent. The objective of the AA section is to establish whether the Project will adversely affect the integrity of European sites, taking into account mitigation measures and the potential for further in-combination effects that may arise from other plans or projects.
- 6.1.2. The following steps have been incorporated into the AA section:
- § Gathering information on, and exploring the reasons for, the relevant European site designations;
 - § Determining the nature of the environmental conditions required to maintain the integrity of the European sites and the trends in associated environmental processes;
 - § Identifying whether the Project could lead to an impact on any identified processes that support the European sites;
 - § Determining whether the identified impact could result in an adverse effect on the integrity of European sites; and
 - § Developing mechanisms to enable the delivery of measures to avoid or mitigate any identified potential effects.

6.2. ASSUMPTIONS FOR APPROPRIATE ASSESSMENT

- 6.2.1. In accordance with recent case law (see Section 3.3), avoidance and mitigation measures designed to reduce harm to European Sites were not considered during the Stage 1 Screening of the Project. At this stage in the HRA process (Stage 2: AA) it is appropriate to consider mitigation measures during the assessment. This assessment has therefore been carried out assuming the implementation of mitigation measures, relevant to the entire programme of works, are embedded in the Project design and targeted measures identified to address potential effects on European Sites.
- 6.2.2. The following assumptions are therefore relevant:
- § An Environmental Action Plan (EAP) will be produced and implemented throughout the Project and all construction activities. The EAP will specify a number of measures to avoid / control impacts on the human and natural environment;
 - § Specific / targeted mitigation measures to avoid or minimise impacts of disturbance Annex II species (otter and fish) will be implemented; and
 - § Pollution prevention controls to avoid or minimise the impacts of habitat degradation on Annex II species (fish) and Annex I habitats (macrophytes).

6.3. RIVER TEIFI SAC

- 6.3.1. The Stage 1 Screening identified that the Project has the potential to result in LSE on the River Teifi SAC, through the degradation of habitats and the disturbance of key species during construction and operational phases of the following designated features:
- § Annex I habitats (macrophyte assemblages of *Ranunculon fluitantis*, *Callitricho-Batrachion* and floating water-plantain *Luronium natans*);
 - § Annex II fish species (brook lamprey, river lamprey, Atlantic salmon, bullhead); and
 - § Annex II species (Otter).

6.3.2. Consideration of the LSE upon these designated features are discussed below.

HABITAT DEGRADATION- ANNEX I HABITATS (MACROPHYTE ASSEMBLAGES)

6.3.3. Annex I habitats vulnerable to hydrological effects include water courses with water-crowfoot and Floating water-plantain. Accidental pollution resulting from the construction activities could also damage water-crowfoot beds. Increased sedimentation associated with the outfall construction and introduction of silt during remediation works could damage water-crowfoot beds and lead to enrichment or pollution of the river. It is not predicted that increased sedimentation from erosion will result during the operational phase due to the estimated low flow rate from the outfall (see Section 2).

Construction Phase

6.3.4. In the absence of mitigation, loss or damage to the Annex I Habitats cannot be ruled out.

6.3.5. Accidental pollution from release of chemicals, fuels or materials that could cause pollution of the River Teifi during construction could occur and this will be managed through implementation of preventive measures outlined by the Guidelines for Pollution Prevention (GPP 5) (NetRegs, January 2017) will be incorporated into EAP.

6.3.6. The outfall construction is anticipated to take approximately 3 days to undertake and cover an excavation of 1.25 m wide trench as shown on Figure 3. Increased sedimentation of the riverbed due to runoff from the construction of the outfall will be avoided by ensuring that no construction works will occur during heavy rainfall events onsite. In addition, the outfall construction will be undertaken in low river flow conditions with the pipe construction to be undertaken prior to the gravel trench construction. Thus, there should be no pathway for sediment release from the outfall construction until the very final punch through from the gravel trench into the river. Bank protection (in the form of willow spilling – final protection material subject to agreement with NRW and landowner) will be provided for a 10 m section of the river bank encompassing the outfall location. Any resultant silt discharge during the outfall construction will be minimal and this will be managed through good silt management procedures as outlined by the GPP 5 and incorporated into the EAP.

6.3.7. Increased sedimentation of the riverbed due to runoff from exposed spoil from the main works will be managed through ensuring that no construction works will occur during heavy rainfall events onsite. The main construction works will also include the construction of a groundwater drainage system prior to the main site construction works by the contractor to stop water from entering the waste material on site, thus controlling outputs of contaminated ground water during construction.

6.3.8. During the earthworks a bund to the south of the main site will be implemented by the contractor within the construction area. The bund will be approximately 0.5m high and any water runoff from the bund will enter a trench/pond immediately south of the bund. Siltation within the trench/pond will be dug out as required and any contaminated sediment utilised within the capping within the main site works. A sump will be present at a suitable location along the southern boundary of the main earthworks site (see general arrangements plan Figure 2), where surface water will be collected and allowed to percolate away. Silt arisings will be dug out and disposed of in accordance with a site waste management plan as necessary. The contractors will ensure that the trench/pond and sump are of sufficient capacity to accommodate any surface runoff from the main site or will generate an overflow with a sedimentation filtration system prior to water runoff into the adjacent field. Good silt management procedures as outlined by the GPP 5 will be incorporated into the EAP, measures include:

- § Toolbox talks would be provided for site staff to advise on particular pollution risks;
- § All chemicals, fuels or materials that could cause pollution of the River Teifi will be stored in such a way that they can be moved easily in the event of a flood. All chemicals, abrasives, liquids will be locked away in a secure container, and away from any watercourses / waterways in order to prevent pollution incidents;
- § Drip trays shall be placed beneath all plant during re-fuelling. Spill kits will be readily available in the unlikely event of an oil or chemical spill. Site staff will be trained in their use;
- § The use of wet concrete around watercourses to be minimised and carefully controlled;
- § Clean water to be diverted away from the area of construction work in order to minimise the volume of contaminated water;
- § Locate material stockpiles at least 10 m away from any ditches / watercourses where the excavated site material is being placed in the north eastern corner of the site;
- § Minimise the amount of time stripped ground and soil stockpiles are exposed by planning the construction period accordingly and implementing mitigation as soon as is feasible;
- § Coverage of any soil stockpiles with impermeable material, during exposure for the duration of the works particularly in relation to adverse weather conditions. The Environmental Clerk of Works will monitor the weather conditions and site activity and advise accordingly;
- § Silt mitigation measures to be monitored at a minimum of once per 24 hour period to maximise efficiency. If mitigation is not effective works are to stop and advice to be sought;
- § Site works would be undertaken in accordance with appropriate best practice including, as a minimum: Construction Industry Research and Information Association (CIRIA) Environmental good practice on site guide (CIRIA, 2015).

6.3.9. With the above detailed appropriate mitigation, it can be considered that there will be no direct impact on the SAC from the short-term construction works of the Project.

HABITAT DEGRADATION - ANNEX II (FISH SPECIES)

6.3.10. Five Annex II species are known to occupy the Teifi (brook lamprey, river lamprey, Atlantic salmon, bullhead). Increased levels of suspended solids and sedimentation which would include increased levels of metal contaminants from the construction of the outflow pipe and main works have been identified as having LSE on the spawning success of Annex II species.

6.3.11. An aquatic walkover survey undertaken by WSP (2020) identified several suitable habitats 100m up and downstream of the proposed outfall location suitable for spawning of the Annex II species that are the primary reason for the designation of the SAC.

Construction Phase

6.3.12. In the absence of mitigation, the disturbance of the Annex II fish species through degradation of habitats cannot be ruled out.

6.3.13. Increased sedimentation of the riverbed and increased levels of metal contaminants due to runoff from construction of the outflow and exposed spoil from main works, can be managed through timing of works, construction methods and good silt and water management procedures as outlined in sections 6.3.6 to 6.3.9.

6.3.14. With appropriate mitigation, it can be considered that there will be no direct impact on the SAC from the short-term construction works of the Project.

DISTURBANCE OF KEY SPECIES - ANNEX II (FISH SPECIES)

- 6.3.15. Five Annex II species are known to occupy the Teifi (brook lamprey, river lamprey, Atlantic salmon, bullhead). Noise and vibration associated with the construction of the outfall within the Zol (50m) have been identified as having LSE on the spawning success of Annex II species. All other works will be situated beyond the 50m Zol and are therefore not considered here.
- 6.3.16. An aquatic walkover survey undertaken by WSP (2020) within 100m up and downstream of the proposed outfall location, identified several suitable spawning habitats of the Annex II species that are the primary reason for the designation of the SAC.

Construction phase - Outfall

- 6.3.17. In the absence of mitigation disturbance of the Annex II fish species cannot be ruled out.
- 6.3.18. The Construction window of any outfall or bankside works within 50m of the River Teifi will be scheduled between July and September so that it falls outside of the spawning seasons of all Annex II species and therefore it can be considered that there will be no direct impact on the SAC from the short term construction works of the Project.

DISTURBANCE OF KEY SPECIES – ANNEX II SPECIES (OTTER)

- 6.3.19. Signs of Annex II species (otter) were found both upstream and downstream of the Project, spraint found within 50 m of the proposed outfall location during the ecological walkover undertaken by NRW (NRW, September 2018), with the closest suitable resting place being 100m upstream.
- 6.3.20. Increased human activity within bankside habitats has been deemed to have a short-term LSE on the otter populations using the Teifi by disrupting their movement along the Teifi.

Construction Phase

- 6.3.21. In the absence of mitigation, disturbance to Annex II species of otter cannot be ruled out.
- 6.3.22. With the implementation of appropriate mitigation, the safe movement of otters around the site can be maintained through:
- § Night time working will not be permitted within 50 m of the River Teifi;
 - § No lighting of the site at night;
 - § Fencing off of riparian habitat that is to be retained with clear marking to prevent inadvertent access;
 - § Exclusion of otters from works areas with the use of fencing near watercourses where use by the species has been established;
 - § Fencing or covering of all excavations related to the construction of the outfall over-night; and
 - § The provision of a suitable ramp within all uncovered excavations during non-working hours.
- 6.3.23. With appropriate mitigation, it can be considered that there will be no direct impact on otter within the SAC from the short-term construction works of the Project.

SUMMARY

- 6.3.24. With the implementation of the above detailed mitigation measures it is considered the Project is unlikely to adversely affect the integrity, structure and function of the qualifying features within the River Teifi SAC.

7. CONCLUSIONS

- 7.1.1. The Project involves the remediation of the Abbey Consols mine site in order to bring the River Teifi in line with WFD standards. The Project lies within 10 km of the Teifi SAC, Elenydd-Mallaen SAC and SPA, and Cors Caron SAC and Ramsar site.
- 7.1.2. The Elenydd-Mallaen SAC and SPA, and the Cors Caron SAC and Ramsar site are considered to lie beyond the potential Zol of the Project's LSE, this is due primarily, to the distance from the Project, in addition to the overall size of the site and suitability of habitats present.
- 7.1.3. No other plans or projects that have the potential to interact with the LSEs could be identified. The Project is therefore not likely to contribute towards any potential in-combination effects upon the River Teifi.
- 7.1.4. Annex I habitats of macrophyte assemblages are likely to be subject to habitat degradation as a result of increased sedimentation and enrichment during times of high rainfall on exposed works areas. Annex II fish species are likely to be subject to habitat degradation from increased levels of suspended solids and sedimentation which would include increased levels of metal contaminants from the construction of the outflow pipe and main works. Habitat degradation will be avoided by implementing timing of works, construction methods, pollution prevention guidance including good silt and water management procedures as outlined in sections 6.3.6 to 6.3.9.
- 7.1.5. The construction phase of the works is likely to have a short-term effects on the populations of Annex II fish species within the Teifi, through disturbance during spawning seasons and habitat degradation due to increased sedimentation. Disturbance of Annex II fish populations will be avoided through timing of works within the Zol (50 m) to fall outside (July-September) of all Annex II fish species spawning periods. Habitat degradation will be avoided by implementing timing of works, construction methods and pollution prevention guidance included within sections 6.3.6 to 6.3.9.
- 7.1.6. The construction phase is considered likely to have short-term effects on Annex II riparian mammal populations (otter) through disturbance within the Zol (50 m). Disturbance of otter populations by disrupting their movement along the Teifi will be avoided by covering or preventing access to any open excavations during the construction phase, where covering or fencing is not practicable the provision of a suitable ramp within all uncovered excavations during non-working hours and through not undertaking night works.
- 7.1.7. The Project is considered unlikely to adversely affect the integrity, structure and function of the qualifying features within the River Teifi SAC, provided the appropriate mitigation measures are implemented and adhered to throughout the works and that environmental mitigation strategies are implemented as specified.

REFERENCES

- § APIS (2011). Air Pollution Information System Database, available at www.apis.ac.uk. Accessed: 2019.
- § CIRIA (2015) Environmental good practice on site guide. 4th edition
- § Convention on Wetlands of International Importance especially as Waterfowl Habitat. Ramsar (Iran), 2 February 1971. UN Treaty Series No. 14583. As amended by the Paris Protocol, 3 December 1982, and Regina Amendments, 28 May 1987.
- § Council of the European Union (1992). Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora. Available online: <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:31992L0043>. Accessed: 2016.
- § Council of the European Union (2009). Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. Available online: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:ev0024>. Accessed: 2016.
- § Department for Communities and Local Government (DCLG) (2012). National Planning Policy Framework.
- § DETR (1998). European Marine Sites in England & Wales: A guide to the Conservation (Natural Habitats &c.) Regulations 1994 and to the Preparation and Application of Management Schemes. Department of the Environment, Transport and the Regions: UK.
- § European Commission (2000). Managing Natura 2000 Sites, the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Available http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf. Accessed 2019.
- § European Communities (2007). Guidance document on Article 6 (4) of the 'Habitats Directive' 92/43/EEC; Available: http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/guidance_art6_4_en.pdf Accessed 2016.
- § European Court of Justice April 2018, Case C-323/17, People over Wind, Peter Sweetman v Coille Teoranta. Judgement of the Court (Seventh Chamber).
- § Her Majesty's Stationary Office (2010). The Conservation of Habitats and Species Regulations 2010/490.
- § HMSO (2007). The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007, SI 2007/1842.
- § Joint Nature Conservation Committee (JNCC) (2016). SAC and SPA Standard Data Forms and Ramsar Information Sheets. Available online: <http://www.jncc.gov.uk/>. Accessed September 2019.
- § Natural Resources Wales (formerly CCW) (2011). Core Management Plan (including conservation objectives) for Afon Teifi Special Area of Conservation. Available online: <https://www.naturalresources.wales>. Accessed September 2019.
- § Natural Resources Wales (formerly CCW) (2008). Core Management Plan (including conservation objectives) for Cors Caron Special Area of Conservation and Ramsar. Available online: <https://www.naturalresources.wales>. Accessed September 2019.
- § Natural Resources Wales (formerly CCW) (2008). Core Management Plan (including conservation objectives) for Elenydd-Mallaen Special Area of Conservation and Special

Protection Area. Available online: <https://www.naturalresources.wales>. Accessed September 2019.

- § Natural Resources Wales (September 2018). Interim Ecological Appraisal Report: Abbey Consols Mine Pontrhydfendigaid, Ceredigion.
- § Natural Resources Wales (2018). Record of a Habitats Regulations Assessment of a project. Abbey Consols Metal Mine Remediation – Ground Investigation Works.
- § NetRegs (January 2017) Guidance for Pollution Prevention 5 - Works and maintenance in or near water.
- § WSP (2019). Abbey Consols, Remediation Study; Outline Design Report.
- § WSP (May 2018). Abbey Consols, Preliminary Ecological Appraisal.
- § WSP (April 2020). Aquatic Habitat Survey.
- § WSP (October 2019) Abbey Consols Information to Inform Habitat Regulations Screening.

FIGURES

Figure 1 – Site Location Plan

Figure 2 – General Arrangement Plan

Figure 3 – Outfall Design

Figure 4 – Phase 1 Habitat Survey map

Figure 5 – Capping and Drainage layout

Figure 6 – European sites within 10km of the Project

Appendix A

PRELIMINARY ECOLOGICAL
APPRAISAL REPORT



Appendix B

ECOLOGICAL APPRAISAL REPORT



Appendix C

AQUATIC HABITAT SURVEY





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