

Environmental Screening Advice Note

Screening completed by	James Dunn
	2049 /10/2022

Project Name	Llywernog Sett Metal Mine Remediation		
Location	Llywernog Metal Mine, Cambrian Mountains Ceredigion	Grid reference	SN SN 73238 80944 (Llywernog Site)
Senior User	Peter Stanley	Senior User Post Title	Metal Mines Programme Lead
Project Manager	Marika Gates	Project Manager Post Title	Project Manager, Coal Authority
Community Risk Register Area (for FRM projects)	-	Strategic Context e.g. CFMP / SMP Policy, RBMP	Water Framework Directive / West of Wales River Basin Management Plan – Rheidol - confluence with Castell to tidal limit. Failing Waterbody Assessment Rheidol.
Set out the background, scope, description, and objectives of the project (information from project mandate)			

Background

The project focuses on the upper part of the waterbody (GB110063041570: Rheidol - confluence with Castell to tidal limit) from Llywernog to Temple Mine (a distance of approx. 4.8km) that makes up the mid part of the Afon Rheidol catchment. The catchment includes the mine sites Powell's, Poole's Llywernog, Llywernog, Clara, Ponterwyd, Crown and Temple. The river flows southerly, passing through Dinas Reservoir and Ponterwyd, to Devil's Bridge where it turns westerly, passing Cwm Rheidol Reservoir before entering Cardigan Bay at Aberystwyth.

The 2012 Water Framework Directive Abandoned Mines Project for the Afon Rheidol catchment splits the Afon Rheidol river system into seven waterbodies however this project focuses on the Rheidol - confluence with Castell to tidal limit. The report classified the waterbody as being of 'Moderate' quality with failures for zinc (Zn) and cadmium (Cd).

The Llywernog Site (see Constraints Map, Annex 1) now forms the Llywernog Silver-Lead Mine Museum. Several buildings associated with the museum including the former wheelhouse, mine offices and ancillary components of the museum are present within the site.

To address the identified risks, it is proposed that the following works are undertaken as part of this Project, with the primary objective of reducing metal loadings in the Afon Rhediol:

- Design and construction of up to three permanent flow gauging structures.
- A water quality monitoring programme to include FGS, mine water and surface waters.
- Investigations at the spoil heaps, which are present at Powell's, Llywernog, Clara and Crown; and
- Optioneering, design, plan and construct of a preferred remedial intervention strategy which may include surface water management interventions and a mine water treatment facility, to treat the mine water discharges from Llywernog Sett, resulting in water quality improvements downstream.

Environmental Screening

Key environmental receptors	Environmental Desk Based Assessment	Follow up Action Required	Who will carry out the follow up action?	Action Tracker
	<u>Population & Human Health</u>	<u>Population & Human Health (Recreation)</u>	PM	
	<p>There are inhabited residences scattered across the study area with a greater concentration in proximity to the Ponterwyd and Crown Mine sites due to the proximity to the village of Ponterwyd.</p> <p>The Llywernog mine site now forms the Llywernog Silver-Lead Mine Museum. The central western extent of the site comprises of a small mound of spoil and open area associated with educational activities as part of the museum.</p> <p>Human health risks exist across these mine sites due to indirect exposure to</p>	<p>The Project Manager (PM) should consider any works-phase impacts on visitors using the area recreationally. Appropriate working hours to be agreed (for contractor or in-house Operations team) with the Ceredigion County Council (CCC) in advance to mitigate any issues relating to construction disturbances. Minimise the footprint and confirm any construction compound requirements.</p> <p>The closest properties to the access roads to site should be informed of the plans. Engage any relevant landowner(s) early, to ensure considerate traffic planning and minimise disruptions.</p> <p>Consult with CCC PRoW officer regarding the work's impact on any PRoWs which run close to and across the sites, if temporary diversions are necessary.</p>		

<p>contaminated waters and sediments and direct risk from geohazards, such as collapse or blow out.</p> <p>The study area is crossed by a number Public Rights of Way (PRoW) including footpaths (70/18/48/1, 70/18/48/2 and 70/18/48/3) which run to the south of the Ponterwyd Mine workings.</p> <p><u>Biodiversity, Fisheries & Invasive Non-Native Species</u></p> <p><u>National Sites Network and other National Designations</u></p> <p>The Rheidol Woods and Gorge Special Area of Conservation (SAC) Site of Scientific Interest (SSSI) and the Coed Rhediol National Nature Reserve (NNR) are all hydraulically linked to these sites via the Afon Llywernog which flows easterly to join the Afon Rheidol appoximatley 300m SW of Ponterwyd. The Temple Mine is within the SAC, SSSI and NNR on the western bank of the Rheidol Gorge just north of Parson's Bridge (SN 74917</p>	<p><u>Biodiversity, Fisheries & Invasive Non-Native Species</u></p> <p>It is recommended that a Preliminary Ecological Appraisal be undertaken by appropriately qualified ecologists to determine whether the protected and priority species recorded by the LRC are still within the vicinity and to confirm whether there are no Invasive Non-Native Species present (as shown on constraints mapping). This will inform more detailed Phase II Habitat or Protected Species surveys that might be required (dependent upon findings). During this phase, also consult Ceredigion County Council (CCC) regarding any TPOs. The surveys undertaken should also consider provisions of the Birds Directive 2009. A Habitats Regulations Assessment (HRA) will be required given the sites connectivity with the Rheidol Woods and Gorge SAC/SSSI/NNR and Cardigan Bay Marine SAC. Similar issues to that encountered on the Cwmystwyth Scheme will be encountered and it's need to be emphasised that this project may need to proceed via the HRA derogation test (i.e. IROPI). Ongoing consultation will be needed with the local Environment Team (CeredigionEnvironmentTeam@cyfoethnaturiolcymru.gov.uk) about the survey work.</p>	<p>PM</p>	
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Commented [WH1]: I don't think this is the case in this instance. This issue for Cwmystwyth is that the Calaminarian Grassland interest feature of the downstream Grogwynion SAC is dependant on metals from upstream mine sites for its existence, the river deposits metal rich sediment which the calaminarian grassland depends. Whilst I haven't had a look at the Rheidol Woods SAC in detail [Microsoft Word - Coedydd A Cheunant Rheidol SAC Plan English.doc](#) ([naturalresources.wales](#)) , whilst there are lichen and bryophyte features I don't think they are reliant on metal rich sediment deposits from the river. Majority of the site is on steep hillside.

<p>79211).</p> <p>The Rheidol Woods and Gorge SAC, SSSI and Coed Rhediol NNR is designated for its old sessile oak woods with Ilex and Blechnum (Annex 1 Habitat), Lichen and Bryophyte Assemblages. The canopy is dominated by sessile oak, and the ground flora has the typical acidophile species and well-developed lower plant component. The woods are also notable for breeding birds including Red Kites.</p> <p><u>The Rheidol Woods are also designated as Ancient Semi-Natural Woodland along the route of the Rheidol within the study area with the site of the Temple Mine being within this designation.</u></p> <p>Northern Cardigan Bay Special Protection Area (SPA) and West Wales Marine SAC are located approximately 17km west of Ponterwyd and hydraulically linked to the site.</p> <p>The Ponterwyd Quarry SSSI is located at the Ponterwyd Mine</p>	<p>Given that a number of the sites (Ponterwyd and Temple Mine) are located within an SSSI and the proximity of the remainder of the sites to these SSSI it is likely SSSI Assent will be required. Consultation necessary with the local Environment Team (CeredigionEnvironmentTeam@cyfoethnaturiolcymru.gov.uk) about the survey work.</p> <p>The proposed scope of works should include INNS/Biosecurity, including a Biodiversity Risk Assessment (EIA regs) and any necessary provisions relating to Invasive Alien Species Order 2019 (seek advice of Enforcement and Permitting; permitting@cyfoethnaturiolcymru.gov.uk).</p>		
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<p>Site and is noted for is Caledonian structures and contains numerous, particularly well-exposed examples of younger folds imposed on the main Caledonian structures.</p> <p>The Bryn Bras SSSI is located to the west of the Afon Rheidol and south of the Afon Llywernog. The Bryn Bas SSSI is an area of undulating upland plateau and steep purple heather and bilberry covered slopes. The upland dry heath overlies a series of north to south ridges that dominates the landform. In places, natural rock exposures and scree provide shelter for grazing animals and habitat for wildlife such as ravens, invertebrates, mosses and lichens. It is of special interest in Ceredigion as an example of an upland community which rarely occurs at such low altitude.</p> <p><u>Protected Species known to be of interest:</u></p> <p>There are a large number of LRC records across the study</p>			
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area, but key interest would be bats, Schedule 1 birds, water voles and vascular and non-vascular plants. A full records search to be undertaken during desk study stage.

There are nationally important metalliferous lower plants present within the study area.

It is anticipated that some additional local vegetation clearance be necessary to improve access to these sites.

Land (eg land take)

The primary surrounding land-use is a mix of upland scrub and low grade grazing lands in the north of the study area. At the Temple Mine site the topography is steeply sloping with the primary cover comprising sessile oak woodland.

Any potential Mine Water Treatment System would require land-take.

Soils (eg organic matter, erosion, compaction, sealing)

<p>The Rheidol Gorge Geological Conservation Review Site (GCRS) is located along the Afon Rheidol and includes the Temple Mine Site.</p> <p>Metal-rich mine waste is likely to be on-sites. Mitigation to prevent the mobilisation of contaminated fine soil/sediments will be required during works.</p> <p><u>Water (eg hydromorphological changes, quantity and quality)</u></p> <p>Rheidol - confluence with Castell to tidal limit fluvial waterbody (Waterbody ID: GB110063041570).</p> <p>The Afon Rheidol is a 'main river' with the Temple Mine being adjacent to the watercourse. Here the Afon Rheidol forms the eastern site boundary of the site.</p> <p>The waterbody currently achieves an overall status of 'Moderate'.</p>	<p><u>Geology & Soils</u></p> <p>If a construction compound is necessary, then it should be minimal (in terms of footprint). Every effort should be made to protect surface and groundwater from contamination during any groundworks and construction (fuel leaks etc.) – follow GPP5 and use correct materials storage procedures. Sampling of groundwater and mine discharge may be required to understand the temporal changes in quality/metal loading.</p> <p>The large cost of contaminated spoil waste disposal should be accounted for during options appraisal.</p> <p><u>Water (inc Water Framework Directive (WFD))</u></p> <p>WFD Preliminary Assessment (screening) is likely to be required – see NRW WFD Assessment Operational Guidance Note. Also, a Flood Risk Activity Permit (FRAP) or Ordinary Watercourse consent is likely required, which will depend on where any proposed works are located (i.e if on main river a FRAP is necessary or not).</p> <p>Geomorphology (oliver.lowe@cyfoethnaturiolcymru.gov.uk) require consultation regarding the engineered channel works and any SMNR opportunities to improve/restore the river environment and/or work with natural processes (WWNP).</p> <p>Water quality and sediment management - particularly during construction – is crucial. The sediment and water quality</p>	
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	<ul style="list-style-type: none"> - Chemical status 'Fail' - Ecological status 'Moderate'. <p>A number of the sites are adjacent to the Afon Llywernog with adit discharges into the watercourse from the Ponterwyd site.</p> <p><u>Air</u> There are no Air Quality Monitoring Stations situation near the proposed project site.</p> <p>Any fine sediment from the spoil tips or groundworks are likely to contain heavy metals.</p> <p><u>Climate (eg greenhouse gas emissions, impacts relevant to adaptation)</u> The Carbon neutrality of these works should be considered via design and offset measures. Net carbon sequestration could be sought through appropriate landscaping using upland vegetation.</p>	<p>management procedures should be outlined clearly in the project Method Statement. Local Environment Team require consulting on this. Further, the works must not increase flood risk and should be planned and timed to minimise the risk of flooding affecting construction – ideally, the construction plant (and any materials) should be stored outside of the floodplain.</p> <p><u>Air</u> Dust suppression would be required if construction is undertaken during a dry period as the mobilised dust may contain significant quantities of heavy metals.</p> <p><u>Climatic Factors</u> Project designers should consider potential opportunities for better local climate change adaption (e.g. minimise GHG emissions, using low-carbon material, offset tree/shrub planting for shade and green engineering options rather than materials with high carbon footprints as well as taking opportunities to restore the natural environment so as to</p>		
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<p><u>Landscape</u> The site is located within the Upland Ceredigion Historic Landscape. This site would also form part of the wider mid-wales historic metal mining landscape character.</p> <p>The study area is not within National Park nor Area of Outstanding Natural Beauty (AONB).</p> <p><u>Cultural Heritage</u> There are a number of Listed Buildings associated with the Llywernog site.</p> <p>There are no conservation Ares within 2km of the study area.</p> <p>There are no Scheduled Monuments at these sites. However, there is a significant risk of unknown archaeology being present across these sites.</p> <p><u>Material Assets</u> Minimal utilities are expected in the wider study area. However</p>	<p>increase carbon sequestration) and sustainable resource management. Any water storage or channel capacity design should account for potentially increasing volumes of water related to more extreme rainfall events.</p> <p><u>Landscape</u> Consultation with NRW Landscape Architect (Marianne.jones@cyfoethnaturiolcymru.gov.uk) is required surrounding the landscaping and reprofiling of the spoil tips, in addition to the watercourse engineering.</p> <p><u>Cultural Heritage</u> Dyfed Archaeological Trust (DAT) have been consulted (response is currently pending from the DAT).</p>	
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Likely consenting route	<p>there may be a concentration of services in the Level Fawr site given its proximity to the village. A search must be undertaken to confirm.</p> <p>Correct waste management procedures should be undertaken, especially in relation to contaminated mine spoil. The PM should be familiar with any necessary waste licencing requirements and contractor checks must be done</p>	<p>Material Assets</p> <p>Progress a utilities search of the project area. Consult with local NRW (Environment Team) and Waste licencing team. The Waste licencing team can advise on the Definition of Waste (Code of Practice and Exemptions).</p>		
	<p>The flow monitoring structures are likely to fall under Permitted Development. Given these are deemed improvements not maintenance works, they will need to be screened and advertised under the Environmental Impact Assessment (Land Drainage Improvement Works) Regulations. Advertisement will need to be in place at least 30 days prior to works commencing. Please contact NRW Environmental Assessment Team for Advertisement Guidance and Template.</p> <p>There is currently limited information as to other works on the ground that may materialise from this project. Those remediation works may require planning permission from Ceredigion County Council or fall under Permitted Development Rights as specified within the Town and Country Planning (General Permitted Development) Order. Once further information is available with regards to the proposed remediation works, consultation should be had with Ceredigion County Council as to the need for planning permission and also a request for an</p>		PM	

Other approvals required	EIA Screening Opinion under the Town and Country Planning (Environmental Impact Assessment Regulations). Should permitted development apply, the work would then need to be screened and advertised under the EIA (Land Drainage Improvement Works) Regulations as per referenced above with regards to the flow monitoring structures.		
	<ul style="list-style-type: none"> - Public Right of Way Temporary Diversion Order - Ordinary Watercourse Consent / Flood Risk Activity Permit (FRAP) - Habitats Regulations Assessment / Potential IROPI Case - Site of Special Scientific Interest Assent (SSSI Assent) 	PM	
Environmental opportunities	<p>The proposed project should consider the Sustainable Management of Natural Resources and any environmental constraints highlighted above. To maximise the multiple benefits delivered by the proposed scheme, the following suggestions are important should be considered:</p> <ul style="list-style-type: none"> • WFD mitigation measures to avoid status deterioration and should seek to positively work towards the WFD objectives for the waterbody – as above – consult with area WFD Lead (Helen Millband) and local element specialists (e.g Hydromorphology – Oliver Lowe, Fisheries – Richard Pierce) for advice and delivery, and report findings; • Seek assistance and review necessary mitigation measures to deliver actions proposed by the Prioritised Improvement Plants (Natura 2000 associated sites, like this SAC); • Identify SMNR opportunities through the restoration of natural forms and WWNP; • Naturalised channel geomorphology to foster flow attenuation, ecological refuge and riparian flora/fauna growth through artificial floodplain connectivity; and • Finally, educational gains could be delivered (as discussed in the Population and Human Health section of this screening). 	PM	

A map ~~of the Red Line Boundary and a map~~ highlighting some of the scheme constraints has been included within Annex 1.

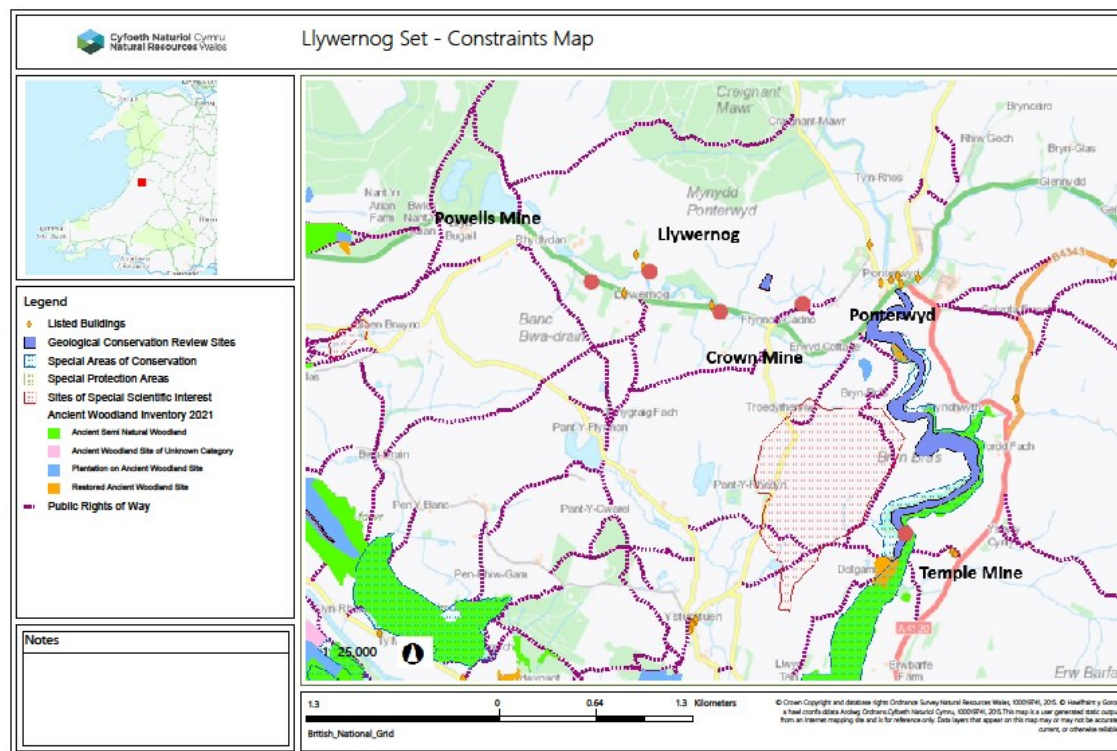
Screening Conclusion

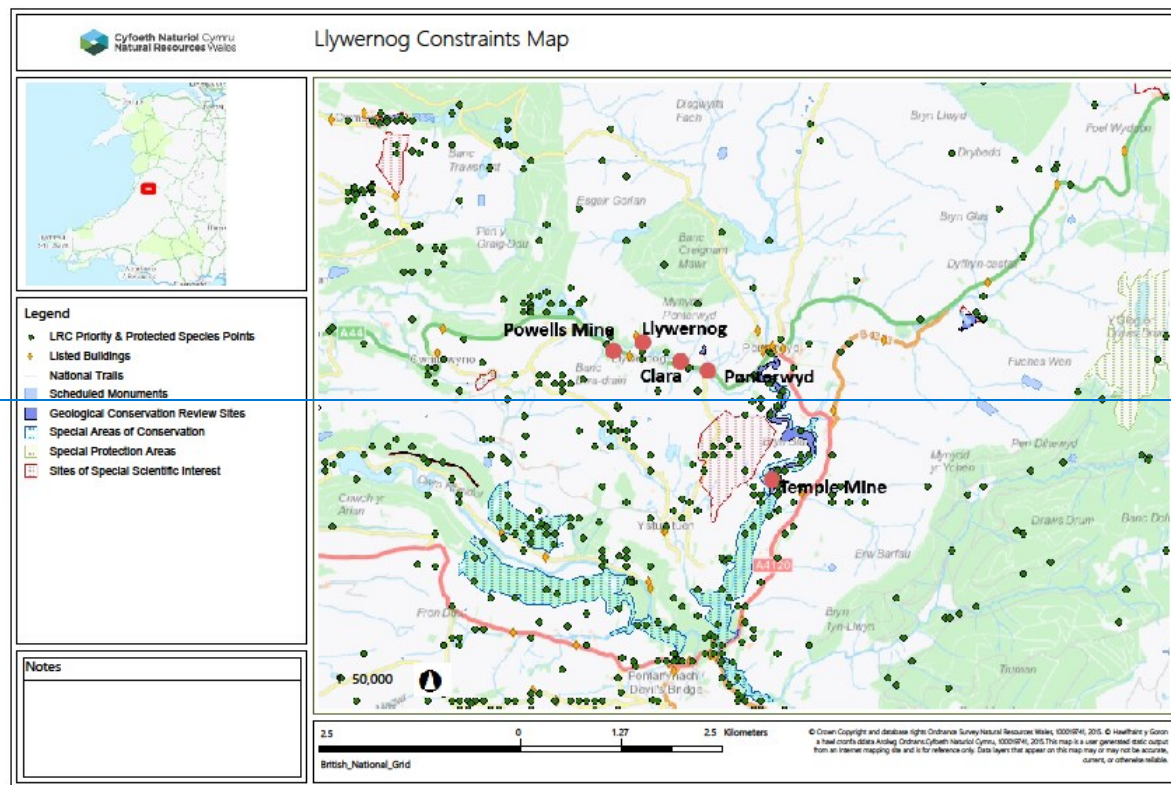
Following a review, the Environmental Assessment Team (EAT) have determined:

- The installation of flow monitoring structures is deemed to be of “Low” environmental risk provided good working practices and any additional mitigation identified are implemented. Development of the design and installation of the flow monitoring structures will not require Environmental Assessment Team (EAT) involvement. It will be the Project Managers responsibility to ensure the necessary targeted environmental surveys/assessment are undertaken and any resulting actions are recorded within an Environmental Action Plan for the flow monitoring structure works.
- With regards to the remedial intervention works, although the extent of works necessary is currently unclear, given nature of the remedial intervention and sensitivity of the receiving environment (in particular the Grogwynion SAC), these works are deemed to be “High” environmental risk. Environmental Assessment Team (EAT) should be included in the project team for the Initial Assessment stage to allow environmental consideration of the options appraisal process and to advise on environmental risk management for the project. The Project Manager should inform EAT of the project programme as early as possible in order that EAT can seek to secure resource to support this project. With regards to the remedial intervention works, the extent of works necessary is currently unclear. It is therefore difficult to determine the level of risk associated with these works. Our current understanding is that the works may include a localised treatment plant and surface water drainage. Considering this, and taking into account the extent of environmental constraints present, we would envisage the works are likely to be of “Medium” environmental risk although we cant be certain at this stage. Installation of the flow monitoring structures and furthering your understanding of the problem (i.e. source of pollution) will not require Environmental Assessment Team (EAT) involvement. **However, give the current uncertainties we ask that the PM re-conslts NRW Environmental Assesment Team (EAT) when developing the long list of options / interventions, in order that we can review this screening and confirm the level of environmental risk associated with this project.**

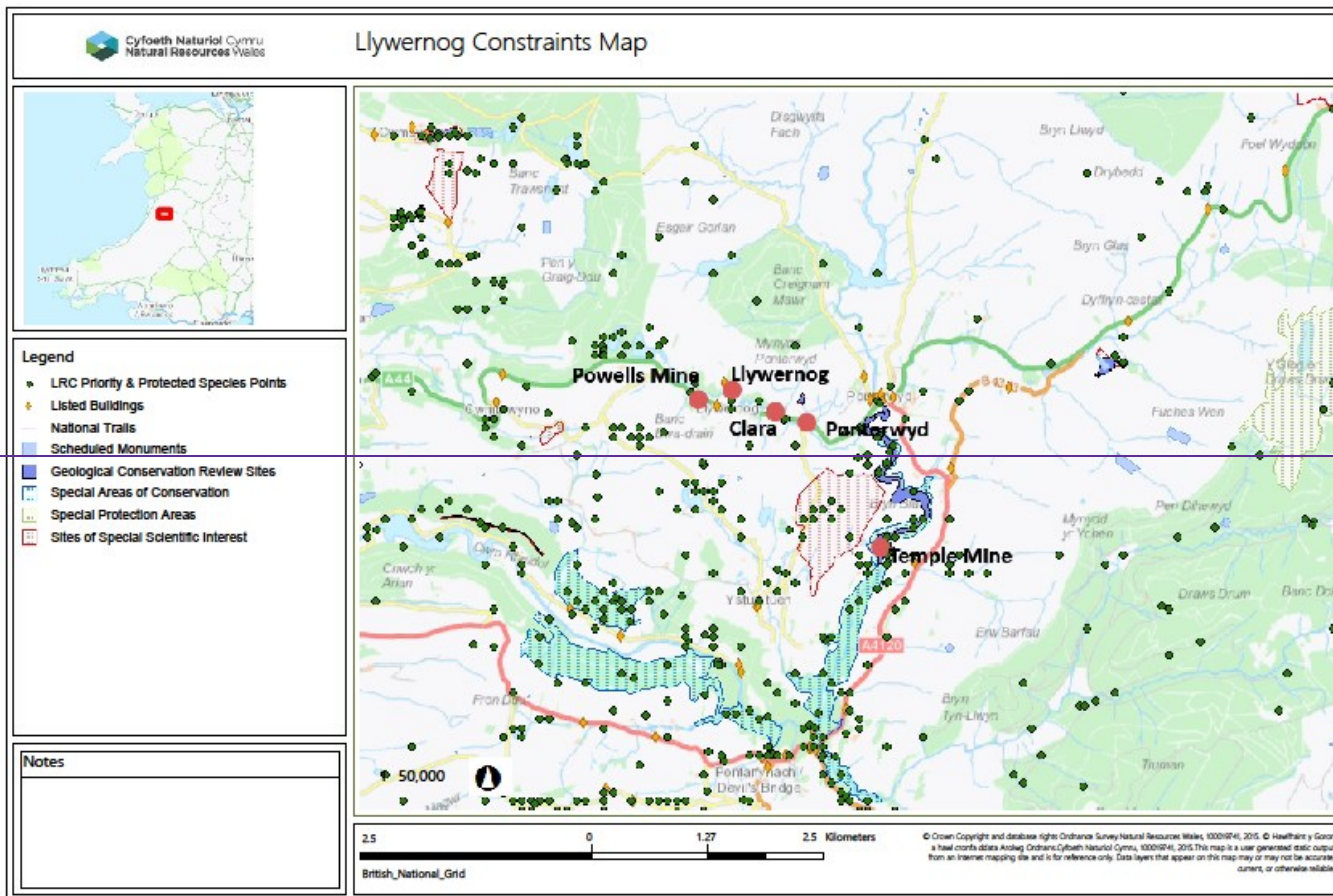
Annex 1: Constraints map

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Annex 1: Constraints map



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Constraints map for Llywernog Sett

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Annex 2: Parties consulted in the screening

Name	Function	Date issued	Response received	Comments Received	Action taken to address comments
Alice Pyper	Dyfed Archaeological Trust	14/10/2022	Pending		
Steven Meaden	NRW Health Policy Team	14/10/2022	Pending		
Oliver Lowe/Elaine Harrison	Geomorphology				
Ceredigion Environment Team	Environment/ecology				
Marianne Jones	Landscape				
Helen Millband / Trevor West	WFD				
Sam Bosanquent	Terrestrial Ecology				