Snowdonia Pumped Hydro

Habitats Regulations Assessment

2023 Review

HRA_0.1
September 2023

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Executive summary

Snowdonia Pumped Hydro Limited (SPH) applied for a Development Consent Order (DCO) for the construction and operation of a pumped storage scheme at the Glyn Rhonwy and Chwarel Fawr quarries, near Llanberis in October 2015. The Glyn Rhonwy Pumped Storage Generating Station Order 2017 came into force on 29th March 2017, which granted consent for the Proposed Scheme.

Since the Order was granted, SPH had progressed its plans to commence construction as per the DCO. After carrying out a competitive tender process following extensive engineering design work, it has become clear that due to the recent spike in inflation of construction materials and labour, the economics of the project has changed; The final investment decision of the project will now rely on the upcoming Large and Long Duration Energy Storage Incentive Scheme from the UK Government which is due to be implemented in 2024. Consequently, it is now unlikely that SPH will be able to commence the authorised development prior to the expiry of the Order on 29th March 2024.

Therefore, a non-material change to the Order is being sought, which seeks to extend the deadline for formal commencement of the authorised development by 24 months to 29th March 2026.

As a non-material amendment (NMA) application is being submitted it is necessary to determine whether the proposed extension of deadline would result in any changes to the specifics or result of the assessment of effects on European Sites.

This Habitats Regulations Assessment (HRA) Report provides updated information to inform the Habitats Regulations Assessment to be produced by the Welsh Ministers when determining the NMA application. These updates have been informed by:

- A review of updates to HRA legislation, policy, and guidance since the 2021 HRA Report was produced;
- An updated search for new/changed other plans and projects for consideration when assessing in-combination effects; and
- Revisiting the potential for Likely Significant Effects (LSE) and Adverse Effects On Integrity (AEOI) in light of any new information identified.

Following completion of this work to update the 2021 HRA Report, it has been concluded that the Proposed Scheme would not trigger adverse effects on the integrity of any European Sites. As per the 2021 HRA Report, for the majority of European Sites, no LSE are predicted to arise. No plans and projects have been identified which could combine with the Proposed Scheme to trigger in-combination LSE.

These findings are in essence the same as those reached in the 2021 HRA Report. No additional assessment work in relation to HRA is therefore required.

1 Introduction

1.1 Project Background

1.1.1. Snowdonia Pumped Hydro Limited (SPH) applied for a Development Consent Order (DCO) for the construction and operation of a pumped storage scheme with an output capacity of 99.9 megawatts (MW) at the Glyn Rhonwy and Chwarel Fawr quarries, near Llanberis ('the Proposed Scheme') in October 2015.

1.1.2. The Proposed Scheme is a Nationally Significant Infrastructure Project (NSIP) and a new kind of grid-scale power storage facility which will fulfil electricity demand by feeding stored energy into the grid.

1.1.3. The Glyn Rhonwy Pumped Storage Generating Station Order 2017 (the Order) was made on 8th March 2017 and came into force on 29th March 2017, which granted consent for the Proposed Scheme.

1.2 Requirement for HRA

1.2.1. Since the Order was granted, SPH had progressed its plans to commence construction as per the DCO. After carrying out a competitive tender process following extensive engineering design work, it has become clear that due to the recent spike in inflation of construction materials and labour, the economics of the project has changed; The final investment decision of the project will now rely on the upcoming Large and Long Duration Energy Storage Incentive Scheme from the UK Government which is due to be implemented in 2024. Consequently, it is now unlikely that SPH will be able to commence the authorised development prior to the expiry of the Order on 29th March 2024.

1.2.2. Therefore, a non-material change to the Order is being sought, which seeks to extend the deadline for formal commencement of the authorised development by 24 months to 29th March 2026.

1.2.3. As a non-material amendment (NMA) application is being submitted it is necessary to determine whether the proposed extension of deadline would result in any changes to the specifics or result of the most recent Habitats Regulations Assessment (HRA) Report, (the '2021 HRA Report') which was produced by AECOM in support of the prior NMA to the DCO.

1.2.4. Since the previous NMA approval, SPH has commenced with the commissioning of long-term pre-commencement monitoring. This includes 12 months pre-commencement water monitoring (as per Requirement 9) and 6 months baseline air quality monitoring (as per Requirement 7). This has involved both liaison and collaboratively working with the Environmental Health department of Gwynedd Council. SPH has also completed a Phase 1 habitat survey on the lower quarry area and platforms.

1.2.5. No changes are being sought to the Order as part of the NMA application other than the two-year extension. Although this change may delay the date of final commissioning (as defined in the Order), the anticipated operational life of the authorised development (as assessed in the certified Environmental Statement (ES)) remains the same.

1.3 Previous HRA Findings

1.3.1. This section summarises the findings of the 2021 HRA Report.

European Sites with potential to experience Likely Significant Effects (LSEs)

1.3.2. Out of the 31 designations, 18 sites were scoped out during initial high level-screening for LSE due to significant distance, no feasible impact pathways and/or no hydrological links. The remaining 13 European site designations were assessed in more detail to determine if the Proposed Scheme would lead to LSE upon them. These 13 sites were:

1. Afon Gwyrfai a Llyn Cwellyn, SAC;
2. Coedydd Derw a Safleoedd Ystlumod Meirion / Meirionnydd Oakwoods and Bat Sites, SAC;
3. Corsydd Mon / Anglesey Fens, SAC;
4. Corsydd Môn a Llyn / Anglesey and Llyn Fens, Ramsar;
5. Eryri / Snowdonia, SAC;
6. Glannau Mon: Cors heli / Anglesey Coast: Saltmarsh, SAC;
7. Glynllifon, SAC;
8. Liverpool Bay / Bae Lerpwl (Wales), SPA;
9. Pen Llyn a'r Sarnau / Lleyn Peninsula and the Sarnau, SAC;
10. Traeth Lafan / Lavan Sands, Conway Bay, SPA;
11. Y Fenai a Bae Conwy / Menai Strait and Conwy Bay, SAC;
12. Y Twyni o Abermenai i Aberffraw / Abermenai to Aberffraw Dunes, SAC; and,
13. Ynys Seiriol / Puffin Island, SPA.

Likely Significant Effects (LSEs) – Impact Pathways

1.3.3. The impact pathways associated with the Proposed Scheme that were identified as having potential to trigger LSE were:

1. runoff, and pollution from surface runoff;
2. direct disturbance to species;
3. nutrient enrichment / eutrophication;

4. changes to water quality; and
5. alteration of flow regime.

1.3.4. The impact pathways that were identified as not having potential to trigger LSE and the rationale for those previous decisions are set out in Table 1.1.

Table 1-1 – Impact pathways without potential to trigger LSE

Impact pathways	Avoidance Justification
Change in aerial pollutant concentrations (NOx, NH_3, nitrogen deposition)	During construction, the potential for significant increases in nitrogen air pollution caused by vehicle emissions will be limited to areas within approximately 100 metres of works areas. The nearest European site is approximately 1.6km away from the Proposed Scheme. There will be no change in aerial emissions of nitrogen during operation and/or decommissioning.
Change in site management	No European sites will experience a change in site management due to the Proposed Scheme.
Construction dust and vehicle movements	IAQM Guidance states that where blasting takes place more than a kilometre away from a sensitive receptor '*…it is considered that irrespective of the nature, size and operation of the site, the risk of an impact is likely to be "negligible" and any resulting effects are likely to be 'not significant*'. The nearest European site is 1.6km away from the Proposed Scheme, hence, this LSE will be scoped out.
Direct habitat loss or fragmentation	There will not be any construction taking place on any European sites, and no habitat removal will be necessary. As a result, there won't be any LSEs on European sites related to direct habitat loss or fragmentation throughout the entire development process.
Increase in lighting	Since the closest European site is 1.6km away from the Proposed Scheme, light spill onto European sites within 30km will not significantly increase. In addition, lighting will be designed to minimise light spillage into surrounding habitats to avoid disturbance to nocturnal wildlife species along with following Obtrusive Light Limitations for Exterior Lighting Installations. Potential for effects on lesser horseshoe bat are considered under the 'Direct disturbance to species' section below.
Noise and vibration	Blasting and stabilisation works during construction have the potential to affect qualifying features that are susceptible to noise within 5km. There are two European sites within 5km of the Proposed Scheme. Neither of them have qualifying features which

Impact pathways	Avoidance Justification
	are sensitive to noise. Moreover, the noise produced by blasting will be periodic and temporary. Effects on lesser horseshoe bat are considered under the 'Direct disturbance to species' section.
Spread of invasive species	Due to the approximate distance of 75m between the proposed intake / spillway pipe and the invasive species Nuttall's pondweed (*Elodea nuttallii*), which was identified during the survey of Llyn Padarn, it is unlikely that the construction work will disturb or spread the species. However, measures will be taken to assist stop the spread as the plant reproduces vegetatively. Himalayan balsam was identified near Llyn Padarn car park within the DCO limits. This could potentially be spread by construction activities. There is a lack of hydrological and other connectivity between the Himalayan balsam locality and any European Sites; as such no LSE are predicted.
Temperature changes	The Q6 spillway is to be used for releasing stormwater runoff under normal operations. If there is restriction on the discharge from Q6 to Llyn Padarn, or a failure of the pumping station, or a heavy rainfall event causing Q1's level to increase, then the Q1 spillway overflow would be used, which discharges into Nant-y-Betws stream. This then discharges into the Afon Gwyfrai SAC. The flows in Afon Gwyrfai SAC are likely to be high during elevated rainfall events, allowing for greater dilution and dispersion of any Q1 spillway overflow waters, and hence attenuating differences in water temperature between water from the Proposed Scheme and the SAC watercourse. The Q1 Spillway also features a low-friction design, which will minimise temperature increases to water flowing over it. On the basis of the above it was concluded that temperature changes to the Nant-y-Betws/Afon Gwyfrai SAC arising from operation of the Q1 spillway would be negligible and would not trigger LSE.

1.3.5. Of the 13 designations mentioned in 1.3.2, the following two European site designations were identified as at risk of LSE that could not be discounted at screening stage.

1. Afon Gwyrfai a Llyn Cwellyn SAC – LSEs include water pollution and runoff effects, nutrient enrichment and eutrophication effects, flow regime effects and water quality effects.
2. Glynllifon SAC - Direct disturbance to species (effects on lesser horseshoe bats and their roosts).

Mitigation measures for potential adverse effects

1.3.6. Mitigation measures were identified in the 2021 HRA Report (and preceding assessments) to avoid, minimise, and mitigate the identified LSE on European Sites. These measures are summarised below. No changes to mitigation provision are being sought via the current NMA application.

Afon Gwyrfai a Llyn Cwellyn SAC

Water Pollution and Runoff – During construction and operation of the Proposed Scheme

To minimise the risk of pollution events and manage them in accordance with best practice, the following elements were designed into the Proposed Scheme. These will be put into practice and are described in the outline Code of Construction Practice (CoCP):

- Using silt traps and settlement ponds, runoff from the site would be filtered and attenuated before being permitted to drain directly into any waterway.
- Areas required for the crushing of slate (which may contain aluminium) will be bunded and will be located at least 20m away from any watercourse. A suitable water treatment regime will also be installed and followed while allocating construction and work areas.
- All vehicle maintenance and refuelling will take place outside of any natural ecosystems, in a dedicated location with an impermeable base.
- On-site storage of oil absorbent material will be sufficient, and spills will be cleaned up right away. All tools used throughout construction and operation will be kept in good operating order and routinely inspected for spills and leaks.
- The Environment Agency's Pollution Prevention Guidelines 5 (PPG5), *Works in, Near or Liable to Affect Watercourses* and PPG6, *Working at Construction and Demolition Sites* will be implemented. Although all PPGs that were previously maintained by the Environment Agency have been withdrawn from use, the Proposed Scheme will still adhere to these guidance documents.
- Depending on the chosen contractor, the availability of local supplies, and the time of year, concrete will either be imported from a nearby batching plant, or a concrete batching plant will be constructed on site. If concrete is batched on site, the risk of spillage and contamination of soils, water, and plants will be kept to a minimum by implementing suitable containment, cleanup, and procedural steps.

Flow Regime – During the operation of the Proposed Scheme.

- To prevent excessive erosion of the Nant-y-Betws, emergency draw down discharge will be managed through an environmental permit and mitigated, and as a result, the flow subsequently entering the Afon Gwyrfai will be limited.

Water Quality –decommissioning

- To help ensure that the draining of water into Llyn Padarn from the Proposed Scheme on decommissioning would not adversely influence water quality of the lake or the European sites into which it flows, testing will be done prior to decommissioning and, if necessary, corrective action will be implemented.

Nutrient Enrichment – During construction and operation of the Proposed Scheme

- Monitoring the water quality of Llyn Padarn before and during abstraction will enable abstraction of water during periods of very poor water quality to be avoided. Any less severe short-term declines in water quality during abstraction from Llyn Padarn into the Proposed Scheme will typically be offset by abstraction during periods when water quality is better, because water will be removed at a moderate pace over an extended period of time. Natural runoff into Q1 and Q6 will also dilute the water abstracted from Llyn Padarn.
- In addition, Q6 spillway is to be used for releasing stormwater runoff under normal operations, which has limited hydrological connectivity to European Sites. The Q1 spillway overflow (which is upstream of Afon Gwyfrai SAC) is unlikely to be used unless there is restriction on the discharge from Q6 to Llyn Padarn, a failure of the pumping station, or a storm event. This is likely to increase the flows in the Afon Gwyrfai offering increased dilution and dispersion of any Q1 spillway overflow waters.
- Nutrient inputs from the catchment will be low due to this area being predominantly comprised of old quarries and slate mines. It is unlikely that the initial abstraction and infill of Q6 from Llyn Padarn will significantly change the chemistry of water. The system's water will be examined for nutrient enrichment, and any necessary corrective action will be completed to avoid the addition of nutrient-rich water to Afon Gwyrfai a Llyn Cwellyn SAC.

Glynllifon SAC

Direct disturbance to species – Effects on Lesser Horseshoe Bat Roosts during construction

- Enhancements will be made to retained tunnels to increase their suitability for roosting lesser horseshoe bats.
- In connection with the 2017 DCO, NRW issued a ‘shadow’ mitigation license in 2016 that was intended just for the Proposed Scheme's effects on roosting bats (including lesser horseshoe bat).

Previous Assessment of Adverse Effects On Integrity (AEOI)

1.3.7. With the application of the mitigation measures described above, the 2021 HRA Report concluded there would be no adverse effects on the integrity of the Glynllifon SAC or Afon Gwyrfai a Llyn Cwellyn SAC.

1.4 Purpose of This Report

1.4.1. The purpose of this report (hereafter referred to as ‘this HRA Report’) is to revisit the findings of the 2021 HRA Report for the Proposed Scheme, to determine any changes. This will identify whether the conclusions of the previous HRA (and the evidence base, guidance, and legislation which informed them) remain valid. Where changes are identified, the potential for these to alter the potential for LSE and AEOI of European Sites will be assessed. Where changes to the assessment of effects on European Sites are identified, these will be reported. Any changes to the predicted significance of effects on European Sites will be clearly set out, to enable these to be considered by the Competent Authority.

2 Methodology and Approach

2.1 Overall Approach to this HRA update

2.1.1. The HRA was last revisited in 2021, to support the 2021 NMA for the Proposed Scheme. The findings of this assessment were reported in the 2021 HRA Report. It is two years since the work for the 2021 HRA Report was completed. The time that has elapsed between production of this HRA Report and production of the 2021 HRA Report is therefore reduced compared to the time that elapsed between production of the DCO application HRA reporting (2016) and the 2021 HRA Report.

2.1.2. For the current NMA application, it is considered disproportionate to completely reproduce the contents of the 2021 HRA Report. This is due to the relatively limited amount of time that has passed since the last HRA update and the fact that the only change requested in the NMA is a two-year extension to the DCO.

2.1.3. The approach taken for this HRA Report is to:

- review and summarise the previous findings;
- to determine where these remain valid or may have changed due to changes in legislation, guidance, and policy in the last two years;
- to consider the potential for the two-year extension to affect the reasoning and conclusions in the 2021 HRA Report; and
- to report the outcomes of the updated assessment of LSE and the potential for AEOI of European Sites.

2.2 Review of Previous HRA

2.2.1. The 2021 HRA Report has been reviewed, to revisit the assessment of LSE and AEOI contained therein. The conclusions made in the 2021 HRA Report have been reviewed and where necessary updated to reflect any new/changed information relevant to the assessment (using information gathered as per section 2.3 below).

2.3 Updating Information

Confirming Relevant European Sites

2.3.1. European sites were confirmed by checking against freely downloadable datasets (available from Natural Resources Wales and/or the Joint Nature Conservancy Council) of the statutory designated sites that form part of the National Site Network (Special Areas of Conservation (SAC) and Special Protection Areas (SPA)) and Ramsar sites.

Review of Legislation, Policy, and Guidance

2.3.2. A review has been completed to determine if there have been any key legislative, policy, and guidance changes that might affect the outcomes of the Previous HRA since it was produced. This has included:

- a review of national and regional guidance pertaining to HRA;
- a review of national and regional policy pertaining to HRA and relevant European Sites, e.g. updated guidance on Conservation Objectives; and
- a review of any changes to the legal framework underpinning HRA in Wales and for NSIPs.

Review of Other Plans and Projects

2.3.3. A review of other plans and projects has been completed to check for other plans and projects which might be relevant for the assessment of in-combination effects. This has included:

- a review of the planning portals for Gwynedd Council, Ynys Mon Council, Conwy Council, and Snowdonia National Park Authority; and
- a review of NSIPs via the National Infrastructure Planning NSIP portal.

3 Results of Legislation, Policy, and Guidance Review

3.1 Review of legislation including case law updates

3.1.1. There have been no changes to primary legislation or case law since the 2021 HRA Report was produced that would change the outcome of the assessment of the 2021 HRA Report.

3.2 Review of Policy updates

3.2.1. There have been no changes to national, regional, or local policy relating to HRA since the 2021 HRA Report was produced, that would change the outcome of the assessment in the 2021 HRA Report.

3.3 Review of Guidance updates

3.3.1. There have been updates to guidance, at a UK and Welsh level, that are relevant to the HRA of the Proposed Scheme. These are described below, along with consideration of how they are relevant to the HRA of the Proposed Scheme and whether they have the potential to change the outcome of the 2021 HRA Report Assessment.

UK & Welsh Government HRA Guidance

3.3.2. In March 2021, the UK and Welsh Governments updated their guidance to Competent Authorities on how they should decide if a plan or project proposal that affects a European site can go ahead[1]. This provides step-wise guidance setting out how Competent Authorities should follow the HRA process when determining applications for plans and projects. This guidance provides a clear and uncontroversial set of principles and actions for Competent Authorities to follow, based on underpinning legislation and pre-existing guidance and good practice. Whilst the guidance is targeted at Competent Authorities, it is also relevant to applicants in terms of setting out expectations for the information they should provide to enable a Competent Authority to complete a HRA of their project.

3.3.3. The methodological approach in the 2021 HRA Report is compatible with the March 2021 UK and Welsh Government's guidance. The March 2021 UK and Welsh government guidance does not therefore have a material impact on the findings of the 2021 HRA Report. Nor does it require a significant change in approach for this 2023 update to this HRA Report for the Proposed Scheme.

[1] Welsh Government (3rd March 2021), Habitats Regulations Assessment: Protecting a European Site - How a competent authority must decide if a plan or project proposal that affects a European site can go ahead.

Planning Inspectorate Advice Note 10 - Habitats Regulations Assessment relevant to nationally significant infrastructure projects

3.3.4. The 2021 HRA Report included due consideration to the Planning Inspectorate (PINS) Advice Note 10 in place at that time (version dated 2017). This advice note provides guidance to applicants for DCOs on how they should approach HRA during preparation of their application and during Examination. Advice Note 10 has been updated since the 2021 HRA was completed. The current version was published in August 2022. The 2022 guidance was updated to reflect changes to legislation, particularly case law, and emerging best practice.

3.3.5. Many of the updates to the Advice Note capture changes to the HRA background that had been considered and where appropriate captured within the 2021 HRA. The updates to PINS Advice Note 10 do not require significant changes to the approach taken in the 2021 HRA Report. The current HRA Advice Note 10 has nevertheless been considered during production of this Current HRA Report.

NRW Guidance on SAC Water Quality

3.3.6. NRW published revised targets for phosphorous concentrations in Welsh SAC rivers in 2021[2] (hereafter referred to as the 'Welsh SAC Rivers Phosphorous Report'). These included tightened targets for the Afon Gwyrfai a Llyn Cwellyn SAC, which is hydrologically connected to and downstream of the Proposed Scheme. The 2021 HRA identified nutrient enrichment as a potential LSE. Phosphorous is one of the primary macronutrients for plants. The revised targets and the level of phosphorous in the Afon Gwyrfai a Llyn Cwellyn SAC relative to them, are therefore relevant to this 2023 update to the HRA Report.

3.3.7. The Welsh SAC Rivers Phosphorous Report identifies different phosphorous targets for two different sections of the Afon Gwyrfai a Llyn Cwellyn SAC. The target for the section upstream of Llyn Cwellyn is not relevant, as the hydrological connectivity between the Proposed Scheme and the Afon Gwyrfai is via the Nant-y-Betws, downstream of Llyn Cwellyn. The section of the Afon Gwyrfai a Llyn Cwellyn SAC into which the Nant-y-Betws discharges has a revised annual mean maximum phosphorous compliance target of 13µg l^{-1}. The Welsh SAC Rivers Phosphorous Report identifies that the Afon Gwyrfai a Llyn Cwellyn SAC downstream of the Nant-y-Betws (and therefore downstream of the Proposed Scheme) is achieving its phosphorous compliance target. An annual mean concentration of 7µg l^{-1} and a growing season mean of 8µg l^{-1} were recorded.

[2] Hatton-Ellis TW, Jones TG (Jan 2021). Compliance Assessment of Welsh River SACs against Phosphorus Targets. Natural Resources Wales, Bangor.

3.3.8. Following the publication of the Welsh SAC Rivers Phosphorous Report, NRW updated the Core Management Plan including Conservation Objectives for the Afon Gwyrfai a Llyn Cwellyn SAC. These were updated to reflect the management requirement for the low nutrient status of the river to be maintained, including achievement of the revised phosphorous target[3].

3.3.9. The changes to water quality targets described above have been considered during the drafting of this HRA Report, as they are potentially relevant to the assessment of effects on the Afon Gwyrfai a Llyn Cwellyn SAC.

[3] Natural Resources Wales (2022). CORE MANAGEMENT PLAN INCLUDING CONSERVATION OBJECTIVES FOR Afon Gwyrfai a Llyn Cwellyn Special Area of Conservation.

4 Likely Significant Effects Screening Results

4.1 HRA Screening Alone

4.1.1. This section of this HRA Report sets out the updated findings in relation to screening for LSE. LSE (or the absence of them) are considered in relation to the identified impact pathways and their zones of influence.

Findings consistent with previous HRA

4.1.2. A total of 29 European Site designations covering 28 different areas of land (one having dual designations and identical boundaries) have been identified within 30km of the Proposed Scheme.

Table 4-1 – European Designated Sites within 30km of the Proposed Scheme

Site Name	Designation	Distance (km)	Direction
Afon Gwyrfai a Llyn Cwellyn	SAC	1.6	SW
Eryri / Snowdonia	SAC	2.2	E
Y Fenai a Bae Conwy / Menai Strait and Conwy Bay	SAC	7	NW
Glynllifon	SAC	7.5	SW
Llyn Idwal	Ramsar Site	7.6	E
Glannau Mon: Cors heli / Anglesey Coast: Saltmarsh	SAC	9.8	W
Y Twyni o Abermenai i Aberffraw / Abermenai to Aberffraw Dunes	SAC	11	W
Traeth Lafan / Lavan Sands Conway Bay	SPA	11.8	N
Coedydd Derw a Safleoedd Ystlumod Meirion / Meirionnydd Oakwoods and Bat Sites	SAC	12.3	NW
Coedydd Aber	SAC	12.5	NE
Corsydd Eifionydd / Eifionydd Fens	SAC	13.8	SW

Site Name	Designation	Distance (km)	Direction
Glan-traeth	SAC	14	W
Liverpool Bay / Bae Lerpwl (Wales)	SPA	17.6	N
Anglesey Terns / Morwenoliaid Ynys MÃ´n	SPA	18.6	W
Mwyngloddiau Fforest Gwydir / Gwydyr Forest Mines	SAC	18.6	E
Corsydd Mon a Llyn / Anglesey and Llyn Fens	Ramsar Site	20 (Anglesey) 32 (Llyn)	N SW
Corsydd Mon / Anglesey Fens	SAC	20	N
Pen Llyn a'r Sarnau / Lleyn Peninsula and the Sarnau	SAC	21.7	S
Ynys Seiriol / Puffin Island	SPA	22	N
Migneint-Arenig-Dduallt	SPA	23.8	SE
Migneint-Arenig-Dduallt	SAC	23.8	SE
Clogwyni Pen Llyn / Seacliffs of Lleyn	SAC	25	SW
Morfa Harlech a Morfa Dyffryn	SAC	25.4	S
Rhinog	SAC	27.3	SE
Llyn Dinam	SAC	28.7	NW
Glannau Ynys Gybi / Holy Island Coast	SPA	29.3	NW
Coedwigoedd Penrhyn Creuddyn / Creuddyn Peninsula Woods	SAC	29.4	NE
Great Orme's Head / Pen y Gogarth	SAC	29.4	NE
Afon Eden - Cors Goch Trawsfynydd	SAC	30	S

4.1.3. The following European sites are not predicted to experience LSE as a result of the Proposed Scheme alone. The assessment for these sites is the same as that reported in the 2021 HRA Report. These sites are:

- Afon Eden - Cors Goch Trawsfynydd SAC;
- Anglesey Terns / Morwenoliaid Ynys MÃ´n SPA;
- Clogwyni Pen Llyn / Seacliffs of Lleyn SAC;
- Coedwigoedd Penrhyn Creuddyn / Creuddyn Peninsula Woods SAC;
- Coedydd Aber SAC;
- Coedydd Derw a Safleoedd Ystlumod Meirion / Meirionnydd Oakwoods and Bat Sites SAC;
- Corsydd Eifionydd / Eifionydd Fens SAC;
- Corsydd Mon a Llyn / Anglesey and Llyn Fens Ramsar Site;
- Corsydd Mon / Anglesey Fens SAC;
- Eryri / Snowdonia SAC;
- Glannau Mon: Cors heli / Anglesey Coast: Saltmarsh SAC;
- Glannau Ynys Gybi / Holy Island Coast SPA;
- Glan-traeth SAC;
- Great Orme's Head / Pen y Gogarth SAC;
- Liverpool Bay / Bae Lerpwl (Wales) SPA;
- Llyn Dinam SAC;
- Llyn Idwal Ramsar Site;
- Migneint-Arenig-Dduallt SPA;
- Migneint-Arenig-Dduallt SAC;
- Morfa Harlech a Morfa Dyffryn SAC;
- Mwyngloddiau Fforest Gwydir / Gwydyr Forest Mines SAC;
- North Anglesey Marine / Gogledd MÃ´n Forol SAC (replaced from Ynys Feurig, Cemlyn Bay and The Skerries SPA);
- Northern Cardigan Bay / Gogledd Bae Ceredigion SPA (replaced from Morfa Harlech a Morfa Dyffryn SPA);
- Pen Llyn a'r Sarnau / Lleyn Peninsula and the Sarnau SAC;
- Rhinog SAC;
- Traeth Lafan / Lavan Sands Conway Bay SPA;
- Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC;
- Y Twyni o Abermenai i Aberffraw / Abermenai to Aberffraw Dunes SAC; and
- Ynys Seiriol / Puffin Island SPA.

4.1.4. The 2021 HRA Report identified that the Proposed Scheme could lead to LSE on the Glynllifon SAC. This risk was identified in relation to the risk of disturbance to lesser horseshoe bats, which are a primary reason for selection of the Glynllifon SAC. The closest

part of the SAC is approximately 7.5 km from the Proposed Scheme. The actual SAC is therefore distant from the Proposed Scheme. The risk of LSE arises because lesser horseshoe bats have been recorded using tunnels which would be lost or disturbed by construction and commissioning of the Proposed Scheme. Lesser horseshoe bats can fly considerable distances from their known roosts. It is therefore possible that lesser horseshoe bats using tunnels within the Order Limits for the Proposed Scheme are part of the SAC population. Should these bats be disturbed during construction and commissioning of the Proposed Scheme this could therefore have an effect on the SAC population. No other impact pathways are considered to trigger LSE on the Glynllifon SAC. These findings remain unchanged from the findings of the 2021 HRA Report.

Findings that have changed since previous HRA

4.1.5. To correct a typographical error in the 2021 HRA Report, Morfa Harlech a Morfa Dyffryn SPA and Ynys Feurig, Cemlyn Bay and The Skerries SPA have been replaced with Northern Cardigan Bay / Gogledd Bae Ceredigion SPA and North Anglesey Marine / Gogledd Mon Forol SAC.

4.1.6. The Afon Gwyrfai a Llyn Cwellyn SAC, was identified in the 2021 HRA Report as being at risk of LSE. This was therefore subject to appropriate assessment, to determine whether the Proposed Scheme could lead to AEOI of this site. The 2021 HRA Report concluded following detailed assessment and with consideration of mitigation measures that there would be no AEOI. The following impact pathways that were assessed in the 2021 HRA Report remain unchanged in relation to the Afon Gwyrfai a Llyn Cwellyn SAC:

- flow regime effects on Afon Gwyrfai a Llyn Cwellyn SAC;
- water pollution and runoff effects on Afon Gwyrfai a Llyn Cwellyn SAC; and
- water quality effects on Afon Gwyrfai a Llyn Cwellyn SAC.

4.1.7. As described in Section 3.3, there have been changes to water quality standards for the Afon Gwyrfai a Llyn Cwellyn SAC since the 2021 HRA Report was produced. It is therefore necessary to consider whether this and related updates to water quality (nutrient) targets for the Afon Gwyrfai a Llyn Cwellyn SAC affect the outcome of the 2021 HRA Report.

4.1.8. The current phosphorus target for the Afon Gwyrfai a Llyn Cwellyn SAC (downstream) is 13µg/l. An assessment of the nutrients in river SACs of Wales was completed by NRW in 2021[4]. The Afon Gwyrfai a Llyn Cwellyn SAC passed the assessment for Phosphorus, with

[4] Compliance Assessment of Welsh River SACs against Phosphorus Targets: cdn.cyfoethnaturiol.cymru/media/693025/compliance-assessment-of-welsh-sacs-against-phosphorus-targets-final-v10.pdf?mode=pad&rnd=132557227300000000

a maximum recorded concentration of 8µg/l. Phosphorous concentrations were therefore under the maximum target concentration, with approximately 5µg/l headroom.

4.1.9. Naturally oligotrophic to mesotrophic water is present in Llyn Padarn. The water used to fill the pumped hydro system will come from Llyn Padarn, which is known to occasionally experience nutrient enrichment and algal blooms since the mid-1800's. The Q1 spillway and Nant-y-Betws watercourse connect the SAC to the Development.

4.1.10. The current Ammonia standard for the Afon Gwyrfai a Llyn Cwellyn SAC (downstream) is 0.2mg/l [Water Framework Directive (WFD) high]. NRW's 'Core Management Plan Including Conservation Objectives for Afon Gwyrfai a Llyn Cwellyn Special Area of Conservation[5]' states in management requirements that '*Water Framework Directive (WFD) monitoring shows that nutrient levels (phosphate and ammonia) in the Gwyrfai river waterbodies are low and currently meet High WFD status.*'

4.1.11. The changes to water quality standards described above indicate the Afon Gwyrfai a Llyn Cwellyn SAC could be more susceptible to the effects of additional nutrient inputs than assessed in the 2021 HRA Report. There remains therefore a risk of LSE arising via additional nutrient inputs in the event of unanticipated discharges to the Nant-y-Betws via the Q1 spillway.

4.2 HRA Screening In-combination

Findings consistent with previous HRA

4.2.1. Two projects that were previously identified as having potential for effects in-combination with the Proposed Scheme are: Wylfa Newydd Nuclear Power Station and Bontnewydd Bypass. Wylfa Newydd Nuclear Power Station has been cancelled and therefore cannot generate effects on European Sites. It can therefore be excluded from the in-combination assessment, as per the 2021 HRA Report. The Bontnewydd Bypass is now operational, and therefore is considered to form part of the baseline, in line with good practice guidance[6]. Bontnewwydd Bypass is therefore also excluded from in-combination assessment.

Findings that have changed since previous HRA

4.2.2. Fifty-nine new plans and projects within 30km of the Proposed Scheme have been identified which on initial high-level screening were considered to have potential to contribute to in-combination LSE. Two of the identified projects were Developments of National Significance

[5] CORE MANAGEMENT PLAN INCLUDING CONSERVATION OBJECTIVES FOR Afon Gwyrfai a Llyn Cwellyn Special Area of Conservation (naturalresources.wales)
[6] DTA Publications (2022). The Habitats Regulations Assessment Handbook.

(DNS). The remaining 57 were smaller scale developments for which planning permission was/is being sought via Town and Country Planning Act applications.

4.2.3. No in-combination LSE are anticipated due to these other developments. This is due to the mitigation strategies and enhancement measures for bats included within the Proposed Scheme and the other projects (where relevant) and the lack of hydrological connectivity with the Afon Gwyrfai a Llyn Cwellyn SAC. The limited scale of development arising from the other developments and the Proposed Scheme and the consequent limited Zone of Influence of impacts arising from these is also relevant to supporting the conclusion of no in-combination LSE.

5 Assessment of Adverse Effects on Integrity

5.1 Adverse Effects on Integrity Alone

5.1.1. This Section of the report provides information on the LSE identified at the HRA screening stage in more detail. For each of the identified impact pathways leading to LSE, an assessment is made as to whether they would result in adverse effects on the integrity of the relevant European Site. The assessment as to whether adverse effects on integrity would arise is made with consideration to mitigation measures that may be applied to avoid, reduce or mitigate effects of the Proposed Scheme.

Findings consistent with previous HRA

Potential for adverse effects on integrity pre-mitigation

5.1.2. The following impact pathways arising from the Proposed Scheme were predicted to lead to LSE, with these findings remaining unchanged from the 2021 HRA Report:

- Alteration of flow regime effects on Afon Gwyrfai a Llyn Cwellyn SAC
- Water quality effects on Afon Gwyrfai a Llyn Cwellyn SAC
- Runoff and pollution from surface runoff effects on Afon Gwyrfai a Llyn Cwellyn SAC
- Disturbance to lesser horseshoe bats - effect on Glynllifon SAC

Mitigation measures for potential adverse effects.

5.1.3. The mitigation measures outlined in section 1.3 of this Report are intended to stay unchanged from the present DCO.

Assessment conclusions

5.1.4. As per the findings of the 2021 HRA Report, no adverse effects on integrity are predicted in relation to the following LSE:

- Alteration of flow regime effects on Afon Gwyrfai a Llyn Cwellyn SAC
- Water quality effects on Afon Gwyrfai a Llyn Cwellyn SAC
- Runoff, and pollution from surface runoff effects on Afon Gwyrfai a Llyn Cwellyn SAC
- Disturbance to lesser horseshoe bats - effect on Glynllifon SAC

5.1.5. As per the 2021 HRA Report, adverse effects on the integrity of the Afon Gwyrfai a Llyn Cwellyn SAC are not predicted to arise. This is due to the minimal risk of impacts and the embedded design and mitigation measures included in the Proposed Scheme.

5.1.6. Measures have been included in the shadow EPS licence for the Proposed Scheme which will protect individual lesser horseshoe bats from the risk of incidental mortality and injury. Measures to enhance retained tunnels for roosting lesser horseshoe bats will provide mitigation for this species, enabling the locality of the Proposed Scheme to continue supporting the species and hence the conservation status of the SAC bat population in the long term. Precise mitigation details would be confirmed following update surveys to inform

the application for an EPS development licence from NRW. Mitigation measures are likely to remain as per the granted DCO. They may be subject to some limited modification through (and therefore securing by) the EPS licensing process with NRW in the event of future changes in the use of the site by roosting lesser horseshoe bats. Given the distance between the Proposed Scheme and the nearest unit of the Glynllifon SAC, any future changes in use of the site by lesser horseshoe bats are unlikely to change the outcomes of this HRA Report.

Findings that have changed since previous HRA

Potential for adverse effects on integrity pre-mitigation

5.1.7. As set out in Section 3.3, NRW published revised targets for phosphorous concentrations in Welsh SAC rivers in 2021. Based on the Welsh SAC Rivers Phosphorous Report, Afon Gwyrfai a Llyn Cwellyn SAC has passed these targets and is in a good condition in relation to phosphorus loading, with concentrations of 7-8µg l^{-1} against a target of 13µg l^{-1}.

5.1.8. The changes to water quality standards described above indicate the Afon Gwyrfai a Llyn Cwellyn SAC could be more susceptible to the effects of additional nutrient inputs than assessed in the 2021 HRA Report. The potential for LSE has therefore been identified in relation to unplanned discharges from the Q1 spillway, as set out in section 4.1

Measures that address the risk of adverse effects on integrity

5.1.9. Several measures were previously identified that will support managing risks associated with nutrient-loaded water. These are described below.

- Monitoring Llyn Padarn's water quality both before abstraction and during the operation will help avoid abstraction of water during any brief intervals of poor quality, which may occur when there will be more catchment washout and higher risk of storm water spills from Llanberis Wastewater Treatment Works due to prolonged rainfall and other intermittent discharges.
- As the majority of the catchment area is primarily comprised of slate mines and old quarries, nutrient inputs from the catchment will be low.
- In addition, during regular operations, the Q6 spillway will be used to release storm water runoff. If there is a limitation on the discharge from Q6 to Llyn Padarn, a pumping station failure, or a storm occurrence the Q1 spillway overflow may be used. Under these circumstances, the flows in Afon Gwyrfai are projected to increase, increasing the dilution and dispersion of the Q1 spillway overflow waters and therefore reducing nutrient concentrations in the water.

Assessment conclusions

5.1.10. Due to the extremely low frequency of discharges and the ability for dilution within the watercourse, occasional discharges from Q1, should they occur, are unlikely to negatively impact the Afon Gwryfai SAC. Greater volumes of discharge would be required in an emergency, but this would be an unlikely and 'one-off' event and would still be subject to

dilution from the point of entering the Nant-y-Betws 1.6 km upstream of the Afon Gwyrfai a Llyn Cwellyn SAC. In addition, as set out above, the Afon Gwyrfai a Llyn Cwellyn SAC is achieving its phosphorus targets with headroom. Any temporary and minor increases in phosphorus concentrations arising from the intermittent and unplanned use of the Q1 Spillway are unlikely to result in the phosphorus target for Afon Gwyrfai a Llyn Cwellyn SAC being exceeded. Based on the above, no adverse effects on the integrity of Afon Gwyrfai a Llyn Cwellyn SAC are predicted.

5.2 Assessment of Adverse Effects In-combination

Findings consistent with previous HRA

5.2.1. The identified European sites were not regarded to be at risk from any LSEs due to in-combination effects with other plans and projects. As such there is not considered to be any risk of in-combination adverse effects on integrity with other plans and projects.

Findings that have changed since previous HRA

5.2.2. Several new plans and projects have been identified within 30km of the Proposed Scheme. These are not predicted to lead to materially altered risks of in-combination LSE as set out at 4.2.3. New or altered other plans and projects are therefore also not predicted to trigger in-combination adverse effects on integrity.

6 Conclusions

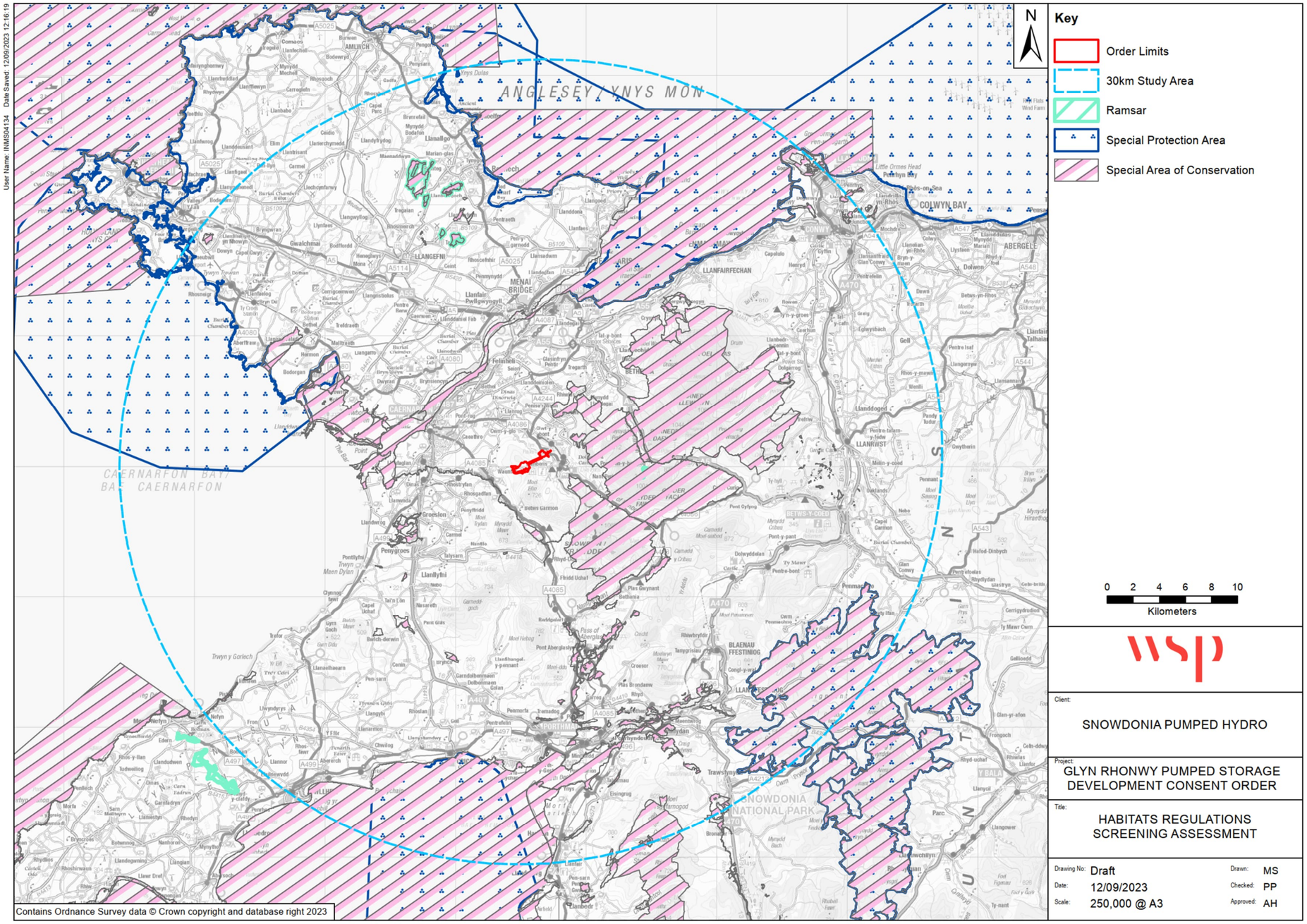
6.1.1. The conclusions of the 2021 HRA Report have been revisited for this HRA Report, with reference to the proposed two-year extension to the DCO and updates to guidance, policy and case law. An updated search for plans and projects that could trigger in-combination effects with the Proposed Scheme has also been completed.

6.1.2. The work completed for this HRA Report has identified changes to water quality (nutrient) standards for the Afon Gwyrfai Llyn Cwellyn SAC. These include more stringent targets than had been assessed at the time of the 2021 HRA Report. Fifty-nine new plans and projects were identified relevant to the assessment of in-combination effects. Details relating to these projects were therefore examined to determine whether they could contribute to in-combination LSE with the Proposed Scheme.

6.1.3. Following the work summarised above and throughout this HRA Report, it has been concluded that the Proposed Scheme would not trigger adverse effects on the integrity of any European Sites. As per the 2021 HRA Report, for the majority of European Sites, no LSE are predicted to arise. No plans and projects have been identified which could combine with the Proposed Scheme to trigger in-combination LSE.

6.1.4. These findings are in essence the same as those reached in the 2021 HRA Report. No additional assessment work in relation to HRA is therefore required.

7 FIGURES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BLAENAU FFESTINIOG
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Project:
GLYN RHONWY PUMPED STORAGE DEVELOPMENT CONSENT ORDER
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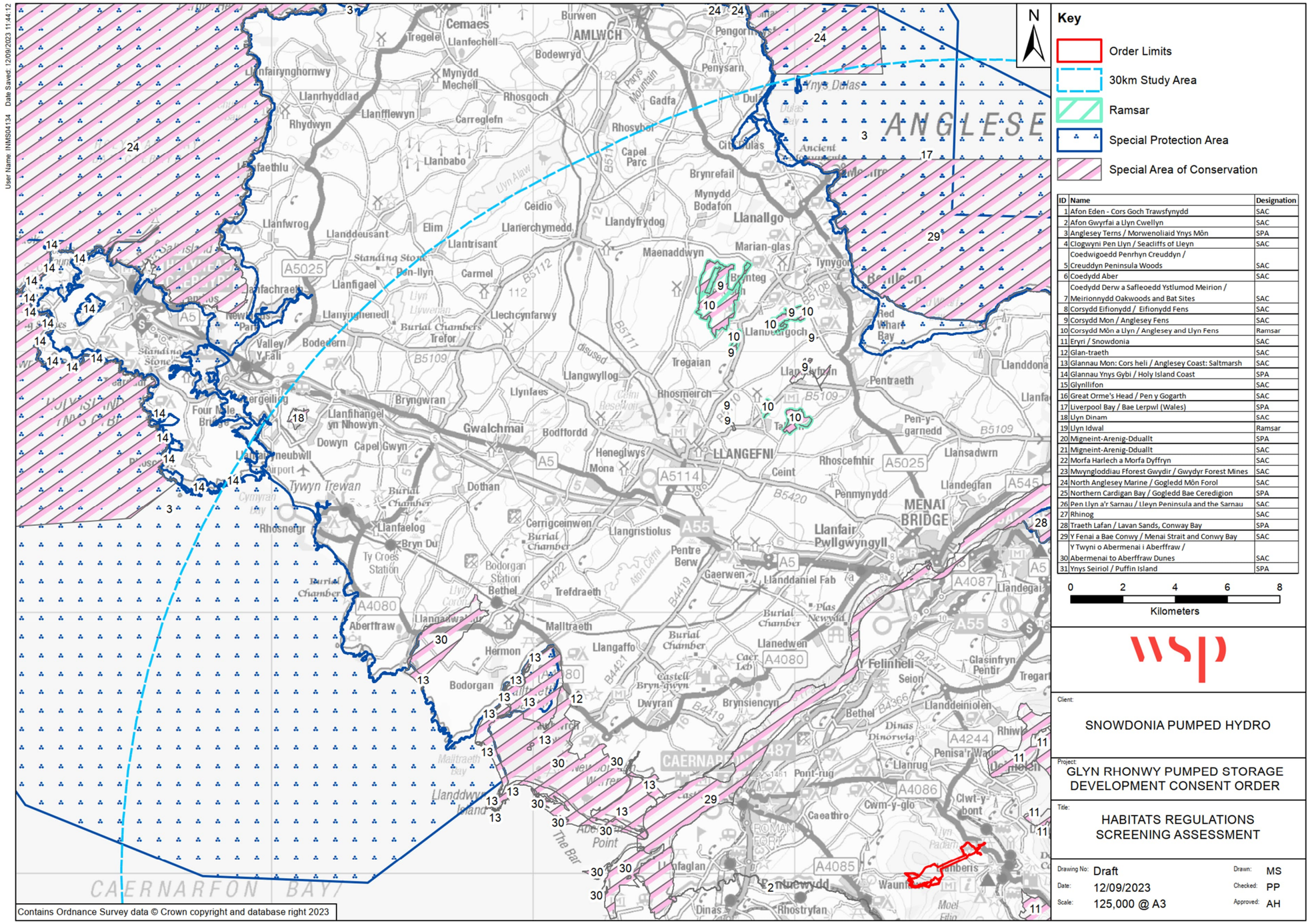

ID	Name	Designation
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27	Rhinog	SAC
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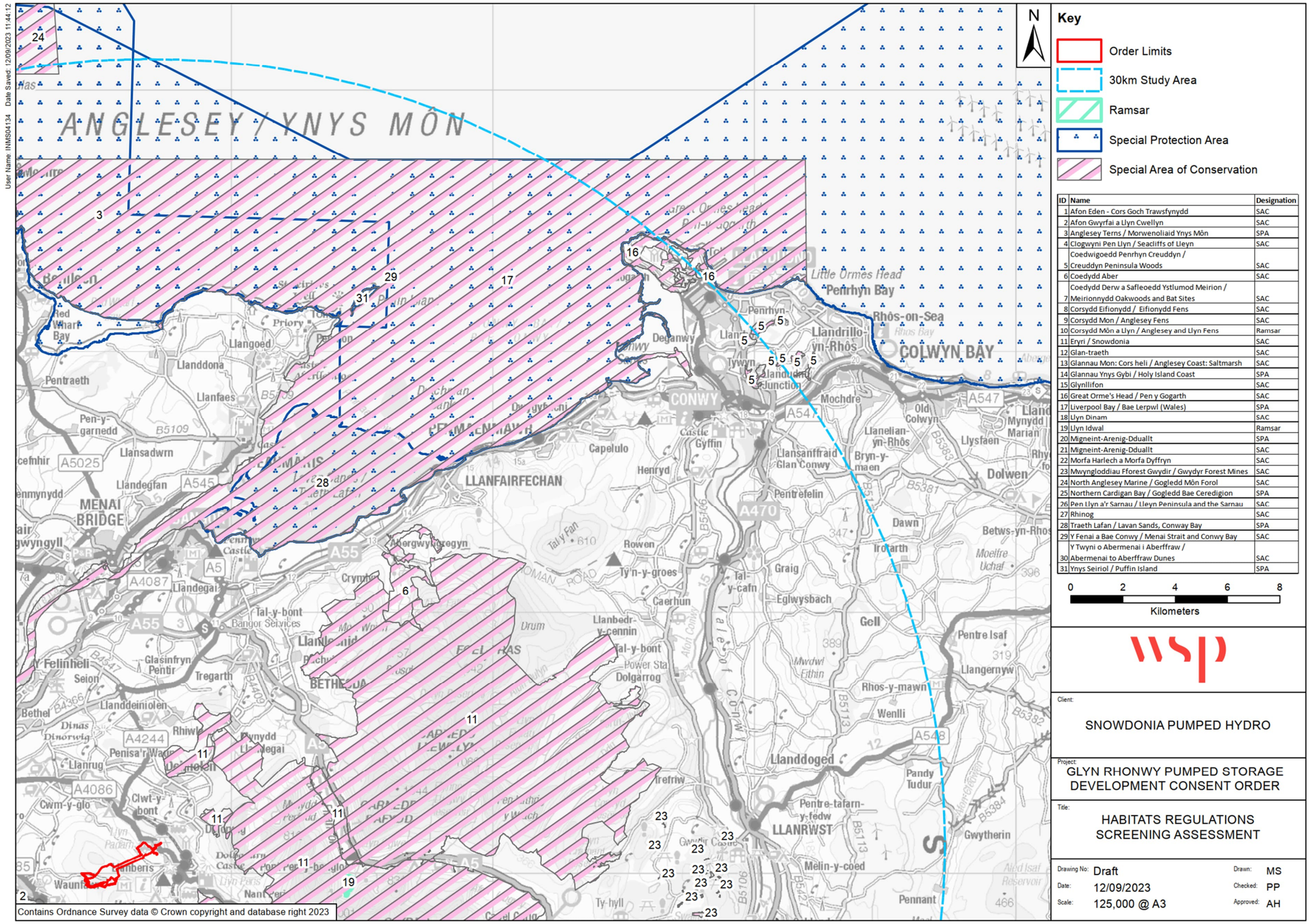

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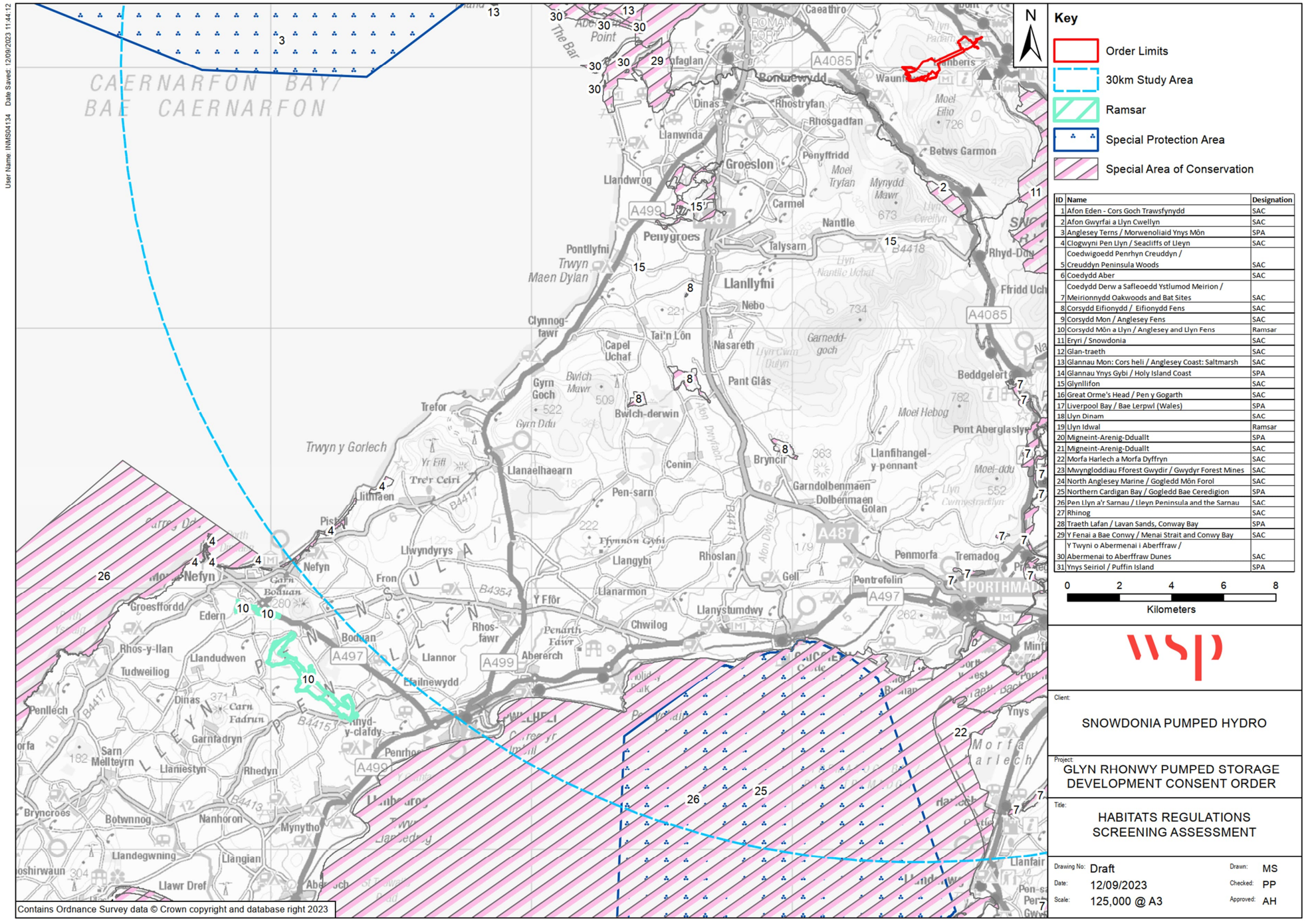
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Ramsar
Special Protection Area
Special Area of Conservation
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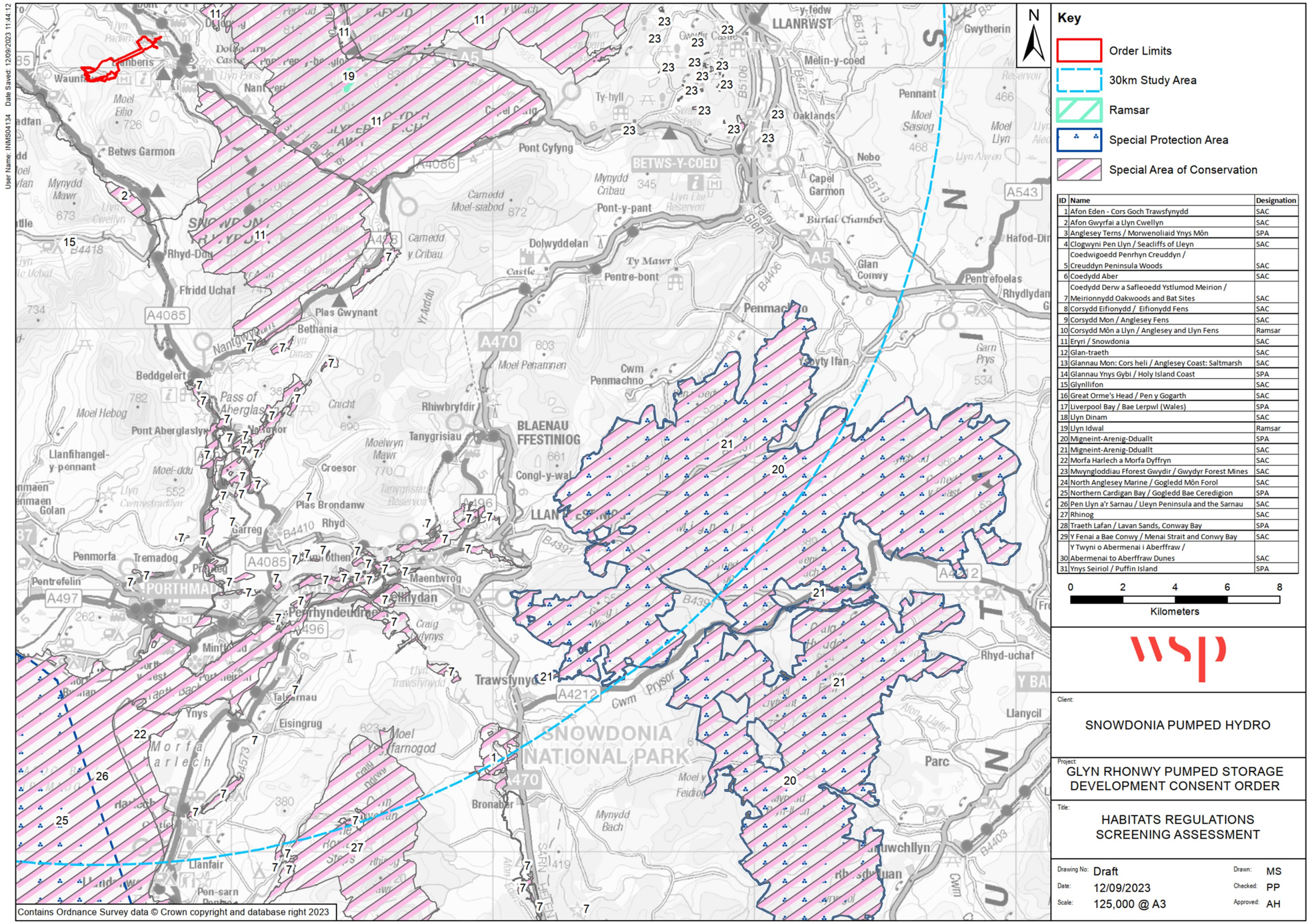

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