

Glyn Rhonwy Pumped Storage (EN010072)

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My PINS Reference: 10031993

My name is Mike Vitkovitch. A Chartered Civil Engineer I have lived close to Llanberis for 40 years. I supervised tunnel construction by drill/blast on the Dinorwig Pumped Storage Scheme from 1974 to 1981, the A55 rock tunnels between 1984 to 1994, and project managed Welsh Government Highway schemes from 2004 to 2010.

Construction Noise/Vibration from Blasting

I raise issue with the absence of any of noise/vibration assessment related to the process of drill/blast which will inevitably be the method for excavating the underground works associated with the proposed development. A tunnel boring machine suggested by the Applicant for tunnelling will be inappropriate for the rock conditions and be uneconomic for the size and length of tunnel involved. I consider it extremely unusual that on a scheme of this scale such a fundamental construction method has not yet been established, particularly when it can have an unacceptable effect on residents and particularly sensitive businesses. BS5228 and BS 6472 should be used for assessing both construction noise as well as the vibration effects of blasting on properties notwithstanding it will be a relatively short term problem.

ES Vol 2 Ch 13 gives the effects as

13.12.5 Surface plant, tunnel drilling and blasting/ boring, and blasting working practices are unlikely to generate levels of vibration at local receptors above which cosmetic damage to structures would be expected. However, exact effects will be dependent upon the working methods employed and further consideration of potential vibration effects will need to be considered once a contractor is appointed.

It is clear that there without the decision on the methods of excavation an appropriate assessment of the effects on receptors cannot be stated as they have yet to be evaluated.

Operational Noise

I am conversant with the use of BS4142 in relation to its use for planning and construction purposes. Unfortunately BS 4142 assesses air borne noise **outside** a property making no reference to LFN and ground vibration which is produced by the operation of power station equipment, nor the effects of ground vibration in properties in the area. I am particularly concerned about this life time ground vibration from turbine pump operation which manifests itself as a continuous vibration/noise particularly significant **inside** residential properties. BS 6472 is the appropriate standard for this issue and not BS 4142 .

It is noted that the ES Vol 2 Ch 13 gives the effects in 13.12.3 as

“With regards to operational noise effects at the power house and pumping station, the Development is predicted to result in effects of negligible at NSRs, and therefore is considered not significant.”
However in their initial response to my Consultation response the Applicant stated that Noise control and mitigation measures will be finalised during detailed design in order to ensure that airborne noise emissions from operational plant will achieve suitable operational limits following guidance from BS 4142. The rating levels of the noise emissions will be determined following guidance from BS 4142, and will include consideration for any acoustic features such as tonality, impulsivity and intermittency.

This response is technically incorrect and unacceptable. There is no assessment of ground borne noise, and this is particularly interesting given that the response to my initial ‘Consultation Report’ No 554 was as follows:

The ES Chapter identified that noise and vibration from underground works would be unlikely to generate levels at which significant adverse effects may occur. However, as stated in Chapter 13, the appointed Contractor will identify potential effects of works noise and vibration once working methods (including underground works) and construction programmes have been confirmed, and in turn appropriate mitigation measures will be implemented. Recommendations for operational noise limits (based on measured level from the baseline noise survey and following guidance from BS4142:2014 ‘Method for rating and assessing industrial and commercial noise’) have been provided in the ES Chapter. Noise control and mitigation measures will be finalised by the Operator during detailed design in order to ensure that airborne noise emissions from operational plant will achieve suitable operational limits following guidance from BS 4142, and any other specific requirements. Specifically with regard to low frequency noise (LFN), BS4142:2014 makes reference to the University of Salford ‘Procedure for the assessment of low frequency noise complaints - NANR45’ (2005) for the assessment of LFN. The NANR45 assessment methodology is based on a comprehensive measurement procedure at a receptor position rather than a prediction procedure. Ultimately it is difficult to carry out a preliminary prediction at this stage and therefore a reliable evaluation of LFN emissions from items of plant as source levels of LFN cannot be accurately measured until the plant is in situ.... Eight other Consultation queries raised the same issue.

The effects of the vibrations from the operation of the Dinorwig station turbines during pump up and generation produce detrimental effects on the residents of houses a kilometre away in the village of Dinorwig . As there is no ‘air’ connection between the houses in Dinorwig and the turbines, these noises are penetrating the properties through the ground and rock as vibration and translating into noise through the resonance of the buildings themselves. Accordingly no amount of double glazing, wall insulation or ear protection can moderate the effects. Furthermore the times when the turbines are idling coincide with the times of day when electrical demand is at its lowest, when residents are at work. Maximum generation is at peak hours in the morning and evening, and the pumping up operation is predominantly during the night. It is at night, when the ambient ‘air’ noise is at its lowest, that the debilitating effects are at their worst, significantly affecting attempts to sleep. The noise is inescapable, and is louder inside the building than outside. The structure can act as a resonance chamber, amplifying the noise and in extreme situations result in standing waves which significantly increase noise levels. It must also be recognised that the operation of two turbines, and indeed two separate power stations, which operate their systems at the same times of

maximum (generation) and minimum (pumping) electrical demand can also result in overlapping vibration waves and consequently produce a 'beat' frequency of higher amplitude than the original.

It is unreasonable that the effect of this 'noise' on properties, has not been adequately evaluated and considered or any factual assessment made in the Application or EIA. The Noise Report is misleading as it only considers air-borne noise against BS 4241 but this is not appropriate for the effects of ground vibration of this type. It is untenable that the powers that would be granted to the developer appear to indemnify or exclude any liability for 'nuisance' caused by the normal operation of the facility when it is this very operation that can give rise to the nuisance of un-assessed noise. I understand the Applicant has refused requests from Dinorwig residents to meet and discuss the noise issue firsthand.

Given the known effects of noise from underground power stations such as at Dinorwig, the Applicant has also failed to make any demonstration the requirements of Gwynedd's Policy C27

*"POLICY C27 - RENEWABLE AND SUSTAINABLE ENERGY SCHEMES, Proposals for renewable energy and sustainable energy management schemes (e.g. hydroelectric ..., pumped water storage,) will be approved provided that **all** the following criteria are met:*

- 5) *that the proposed development will not create an unacceptable increase in the levels of noise, smells, dust or fumes;"*

The properties already affected by the Dinorwig power station are 1km north west of the turbine house and 200m above it. In the case of the proposed development the distance from the nearest residence in Llanberis is 1km and approximately 100m in height above it. There are several businesses, including accommodation as close as 400m to the proposed turbines.

The wording of the Gwynedd Policy says 'acceptable' and there is no doubt that the list of people who suffer Dinorwig's noise consider it in any way 'acceptable'. It is therefore beholding on the developer to demonstrate that his turbine/generators will not produce unacceptable noise and vibration. As mentioned before and accepted by the Applicant the use of BS 4241 is not appropriate for establishing low frequency noise of this type. It is also unacceptable for the Applicant to state that the matter cannot be assessed until after the installation is operational and shield himself from compensation issues by exempting 'nuisance caused by the operation of the scheme' in powers to be granted. There has been considerable work done on underground railways in London in predicting the noise at nearby properties. With Dinorwig as a model, making such predictions for the proposed scheme are quite feasible. The technology is available.

In conclusion the ES can be construed as misleading and fails to meet the requirements of EU Directive 2014/52/EU in providing accurate and informed information in that describes the effects of noise on the environment and local residents.

Glyn Rhonwy Pumped Storage (EN010072)

My PINS Reference: 10031994

My name is Mike Vitkovitch. I am the British Horse Society Access Officer covering the Gwynedd and Snowdonia area. I am also a Chartered Civil Engineer and Member of both the Snowdonia (North) and Arfon and Dwyfor Local Access Forums. I have an extensive practical knowledge of highways, access design and construction and how these best interface with equestrian needs. I regularly work with the Local Authority and National Park on multi-user and equestrian routes.

I note from the documents supplied and the responses to Consultation that the unclassified road from Llanberis to Waunfawr is to be changed and improved to accommodate the scheme and access to Q1.

At the Public Consultation I made the point (No554) that the road was indeed an unclassified road, and not a Public Right of Way (ie shown on the Definitive Map) as incorrectly indicated by the Consultation documents. It is in regular use by all users including cycles, horses, horse and trap, motorcycles and motor vehicles. This error has been acknowledged in the Applicant's response to my Consultation query No554.

I also noted the lack of information about the proposed changes proposed by the Applicant. There is a reference in Consultation No 562 to 'bringing the road up to a condition for Adoption,' however as the road is already a Highway Maintainable at Public Expense. Adoption is not a legal option. There would appear to be a general lack of understanding by the Applicant of the words and technical terms he uses in his reports and responses.

I am concerned that the realigned route retains its character and should not be surfaced with bituminous materials between raised concrete kerbs. This provides an unsatisfactory surface for equestrians particularly on steep slopes. In general the tarmac section down to Waunfawr has adequate grass verges that are particularly suitable for horses.

With the exception of the condition and means of hanging of some of the gates on other sections of the track to Llanberis, the nature of the track has a character appropriate for equestrians in a mountain setting.

I therefore request that the proposed 'improvements' to the unclassified road be carried out sympathetically to the location. The use and in particular the design and operation of gates, if any, are carried out in accordance with the appropriate equestrian standards in the Design Standards for Roads and Bridges or to the British Horse Society recommendations.

I will be pleased to offer equestrian advice to the Designer on these aspects to ensure that any new works provide the maximum benefit for all users.

Michael Vitkovitch

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