

Elwy Solar Energy Farm

ENVIRONMENTAL STATEMENT

APPENDIX 9.1 AIR QUALITY TECHNICAL NOTE

P19-2023 | JULY 2020

Document Control

Client	Solarcentury	Principal Contact	James Walker (Pegasus Group)
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Job Number	J4215
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Document Status and Review Schedule

Report No.	Date	Status	Reviewed by
J4215A/1/F1	2 July 2020	Final	Dr Ben Marner (Technical Director)

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1 Introduction

1.1 This technical note describes the potential air quality impacts associated with the proposed solar energy farm on land northwest of St Asaph in Denbighshire. The assessment has been carried out by Air Quality Consultants (AQC) Ltd on behalf of Solarcentury.

1.2 The Scoping Direction received from the Planning Inspectorate requires that air quality is scoped into the Environmental Statement (ES), as:

“information provided to date does not consider whether there are nature conservation designated sites along the proposed construction traffic route which could be affected by the emissions generated by construction traffic, in particular HGVs. Additional information is required regarding construction traffic emissions and location of any ecological sensitive receptors before this aspect could be scoped out.”

1.3 The application site covers approximately 118 hectares of agricultural land, which will be covered with ground-mounted photovoltaics and battery storage to produce up to 62 MW of electricity. Whilst the operation of the solar farm will not result in any direct emissions to air, the construction works have the potential to generate additional vehicles on the local road network, which may impact on any ecological habitats adjacent to the roads used by construction vehicles. The main air pollutants of concern related to road traffic emissions are nitrogen oxides (NO_x), ammonia (NH₃), nutrient nitrogen deposition and acid nitrogen deposition.

1.4 This note considers the volume of construction traffic, construction traffic routing and the proximity of designated habitats, and the period over which construction will take place. It has been prepared taking into account all relevant local and national guidance and regulations.

2 Policy Context

- 2.1 The United Kingdom formally left the European Union (EU) on 31 January 2020; until the end of 2020 there will be a transition period while the UK and EU negotiate additional arrangements. During this period EU rules and regulations will continue to apply to the UK. All European legislation referred to in this note is written into UK law and will remain in place beyond 2020, unless amended, although there is uncertainty at this point in time as to who will enforce the requirements of some of this legislation.

Air Quality Strategy

- 2.2 The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. Local authorities are seen to play a particularly important role. The strategy describes the Local Air Quality Management (LAQM) regime that has been established, whereby every authority has to carry out regular reviews and assessments of air quality in its area to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an Air Quality Management Area (AQMA), and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

The Clean Air Plan for Wales

- 2.3 The consultation draft of the Clean Air Plan for Wales was published in December 2019 (Welsh Government, 2019). This sets out interventions to improve air quality and how they align with other Welsh plans and policies, and includes a priority to develop a Clean Air Act for Wales. In addition, it includes plans to consult on new targets for particulate matter, carry out a review of the LAQM and Smoke Control regimes, publish a Clean Air Zone (CAZ) Framework, and increase awareness of the influence of both indoor and outdoor air quality on public health.

Policy for the Protection of Sensitive Ecosystems

European Policies

- 2.4 The “Habitats Directive” (The Council of European Communities, 1992) requires member states to introduce a range of measures for the protection of habitats and species. The Conservation of Habitats and Species Regulations (HMSO, 2010) transpose the Directive into UK law. They require the Secretary of State to provide the European Commission with a list of sites which are important for the habitats or species listed in the Directive. The Commission then designates worthy sites as

Special Areas of Conservation (SACs). The Regulations also require the compilation and maintenance of a register of European sites, to include SACs and Special Protection Areas (SPAs), with the latter classified under the “Birds Directive” (Directive 2009/147/EC of the European Parliament and of the Council, 2009), which is implemented in UK law through the Conservation of Habitats and Species Regulations (The European Parliament and the Council of the European Union, 2009). These sites form a network termed “Natura 2000”.

- 2.5 The Regulations primarily provide measures for the protection of European Sites and European Protected Species, but also require local planning authorities to encourage the management of other features that are of major importance for wild flora and fauna.
- 2.6 In addition to SACs and SPAs, some internationally important UK sites are designated under the Ramsar Convention. Originally intended to protect waterfowl habitat, the Convention has broadened its scope to cover all aspects of wetland conservation.
- 2.7 The Habitats Directive (as implemented by the Regulations) requires the competent authority, which in this case will be the planning authority, to firstly evaluate whether the development is likely to give rise to a significant effect on the European site. Where this is the case, it has to carry out an ‘appropriate assessment’ in order to determine whether the development will adversely affect the integrity of the site.

National Policies

- 2.8 Sites of national importance may be designated as Sites of Special Scientific Interest (SSSIs). Originally notified under the National Parks and Access to the Countryside Act (1949), SSSIs have been re-notified under the Wildlife and Countryside Act (1981). Improved provisions for the protection and management of SSSIs (in England and Wales) were introduced by the Countryside and Rights of Way Act (2000) (the “CROW” act). If a development is “*likely to damage*” a SSSI, the CROW act requires that a relevant conservation body (i.e. Natural England) is consulted. The CROW act also provides protection to local nature conservation sites, which can be particularly important in providing ‘stepping stones’ or ‘buffers’ to SSSIs and European sites. In addition, the Environment Act (1995) and the Natural Environment and Rural Communities Act (2006) both require the conservation of biodiversity.
- 2.9 National planning policy on biodiversity and conservation is set out in the NPPF (2012). This emphasises that the planning system should seek to minimise impacts on biodiversity and provide net gains in biodiversity wherever possible as part of the Government’s commitment to halting declines in biodiversity and establishing coherent and resilient ecological networks.
- 2.10 The Environment (Wales) Act (Welsh Government, 2016) replaces the biodiversity duty in the Natural Environment and Rural Communities Act (2006). This duty requires that public authorities seek to maintain and enhance biodiversity in the proper exercise of their functions. The duty also

helps to deliver the sustainable management of natural resources, as it will require public authorities, in delivering the new biodiversity duty, to promote the resilience of ecosystems.

- 2.11 Local planning authorities should set criteria-based policies against which proposals for any development on or affecting protected wildlife sites will be judged, making distinctions between different levels of site designation. If significant harm from a development cannot be prevented, adequately mitigated against, or compensated for, then planning permission should be refused.

Design Manual for Roads and Bridges Guidance

- 2.12 The Design Manual for Roads and Bridges (DMRB) provides guidance and requirements for the design and impact assessment for strategic road schemes in the UK. DMRB LA 105 (Highways England, 2019) provides guidance on assessing impacts on air quality. The guidance is produced by Highways England and overseen by the Welsh Government, among others.

Assessment Criteria

- 2.13 Objectives for the protection of vegetation and ecosystems have been set by the UK Government. They are the same as the EU limit values. The limit values and objectives only apply a) more than 20 km from an agglomeration (about 250,000 people), and b) more than 5 km from Part A industrial sources, motorways and built up areas of more than 5,000 people. Critical levels and critical loads are the ambient concentrations and deposition fluxes below which significant harmful effects to sensitive ecosystems are unlikely to occur. Some of the critical levels are set at the same concentrations as the objectives, but do not have the same legal standing. Typically, the potential for exceedances of the critical levels and critical loads is considered in the context of the level of protection afforded to the ecological site as a whole. For example, the level of protection afforded to an internationally-designated site (such as a SAC) is significantly greater than that afforded to a local nature reserve; reflecting the relative sensitivity of the sites as well as their perceived ecological value.

Screening Criteria for Road Traffic Assessments

- 2.14 The DMRB has developed scoping criteria which determine whether an assessment of air quality impacts is required. The approach compares the changes in vehicle flows on local roads against the following criteria, in order to determine “affected” roads:
- Road alignment will change by 5 m or more;
 - Daily traffic flows will change by 1,000 AADT or more;
 - Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or
 - Significant changes in speed or congestion are predicted.

- 2.15 Where the changes in vehicle flows on a road, speed or alignment do not satisfy any of the above criteria, the impact of a scheme can be considered to be neutral in terms of local air quality and no further work is needed.
- 2.16 The guidance then requires any nature conservation sites, and their characteristics, near to any affected road to be identified. Only sites within 200 m of roads affected by the project require consideration.
- 2.17 Natural Resources Wales has previously indicated that it accepts the use of the DMRB traffic flow screening criteria when assessing air quality impacts on nature conservation sites.
- 2.18 When assessing impacts on internationally-designated ecological sites, there is a potential issue of whether these screening criteria should be applied to a scheme in isolation (as recommended in the DMRB guidance) or to a scheme in combination with other plans and projects (as explained in case law¹). However, as shown in Section 3, there are no internationally-designated sites close to roads identified in the Construction Traffic Management Plan for the proposed development. When applied to locally-designated sites, it is appropriate to apply these criteria directly in line with the DMRB advice and thus to the change caused by a scheme in isolation.

¹ Judgment in *Wealden District Council v Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority* [2017] EWHC 351.

3 Impact Assessment

Construction Traffic Routing

- 3.1 The Construction Traffic Management Plan (Pegasus Group, 2020) states that vehicles arriving at the site will access from the A525 northbound carriageway, via the A525/A55 North Wales Expressway roundabout. Vehicles exiting the site will route northbound along the A525 where they will access the A525 / A547 Ffordd Abergele / Station Road roundabout.
- 3.2 The proposed main routing arrangement, along with 200 m distance buffers from these roads, are provided in Figure 1. Figure 1 shows the location of the proposed solar farm in relation to the nearest designated habitats. The nearest internationally-designated site, Liverpool Bay Special Protection Area (SPA) is 6.6 km northwest of the application site, whilst the nearest locally-designated site, an unnamed Ancient Woodland (AW) is 300 m east of the application site. Figure 1 shows that Rhuddlan Pond Local Nature Reserve (LNR) and an unnamed Ancient Woodland are within 200 m of the main roads used by construction vehicles.

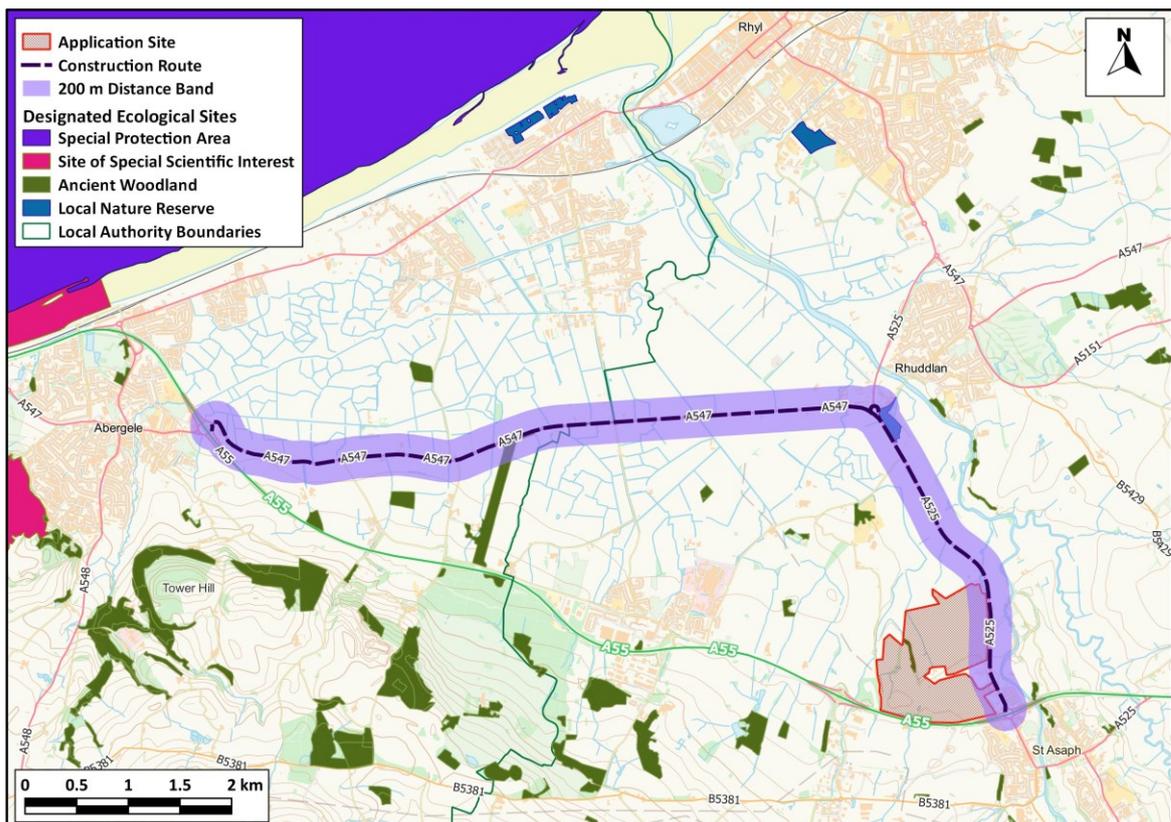


Figure 1: Construction Traffic Routing and Designated Ecological Sites

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Construction Period

- 3.3 The Construction Traffic Management Plan (Pegasus Group, 2020) states that the construction period will last up to 27 weeks. On this basis, it is concluded that any effect from construction traffic on designated ecological sites will be transient, any changes to ambient air quality conditions will re-equilibrate within a short period of time following completion of the construction phase, and there will be no long-term deterioration in conditions.

Construction Traffic Volumes

- 3.4 Table 1 presents the anticipated number of construction vehicle types associated with each phase of construction and the total number of one-way vehicle trips throughout the entirety of the construction period.

Table 1: Vehicle Types and Number of Deliveries

Phase	Number of Vehicles (One-way Trips)
Heavy Duty Vehicles	
Modules	260
Inverters	25
Substations	21
Cable	70
Piles	60
Framework	120
Temporary Trackway	50
Entranceways	20
Material for Connection Substation	10
Concrete Blocks and Sand for Sub-bases	100
Aggregate for the Road	800
Other Aggregate (Trenches etc.)	100
Deer Fence	15
Site Compound Facilities and Additional Fence	60
Construction Plant Delivery	60
Site Skips	200
Crane for Substations	30
Battery Substations	50
Total	2,051
Light Duty Vehicles	

Phase	Number of Vehicles (One-way Trips)
Minibus	648
Large Van	324
Private Vehicles	3,726
Total	4,698

- 3.5 During this period, the construction works will generate 2,051 one-way Heavy Duty Vehicle (HDV) trips and 4,698 one-way Light Duty Vehicle (LDV) trips. To calculate an AADT flow to compare against the DMRB screening criteria (as presented in Paragraph 2.14), the one-way flows are multiplied by two (to calculate two-way flows) and averaged over a calendar year (365 days).
- 3.6 The construction phase will, therefore, generate AADT flows of 11 HDVs and 26 LDVs on the main identified construction route. Beyond this route, vehicles will distribute across the local highways network, such that flows on other roads will be lower.

Assessment of Significance

- 3.7 The assessment has identified that the Rhuddlan Pond Local Nature Reserve (LNR) and an unnamed Ancient Woodland lie within 200 m of roads included in the Construction Traffic Management Plan. However, as described in Paragraph 3.6, the construction phase will generate AADT flows of 11 HDVs and 26 LDVs; these are well below the screening criteria of 200 HDVs and 1,000 LDVs presented in the DMRB guidance (see Paragraph 2.14). Further, as the construction phase will only last for 27 weeks, any air quality effects on designated sites will be temporary in nature.
- 3.8 Beyond the network identified in the Construction Traffic Management Plan, traffic will distribute across the local highways network, such that site-related flows on other roads will be even lower.
- 3.9 As explained in Paragraph 2.17, Natural Resources Wales has previously indicated that it accepts the use of these criteria for the protection of designated ecological habitats in Wales. On this basis, the impact of the construction of the proposed solar farm can be considered to be neutral in terms of local air quality and no further work is needed.

4 Summary and Conclusions

- 4.1 This technical note has considered the air quality impacts of construction traffic on sensitive designated sites using the DMRB guidance.
- 4.2 The construction phase will generate additional vehicles on the local road network; however, these have been shown to be well below the DMRB screening criteria and for a temporary period of up to 27 weeks only.
- 4.3 Based on DMRB guidance, the impact of the construction of the proposed solar farm in St Asaph on designated sites is considered to be neutral, and no further assessment is required.

5 References

Countryside and Rights of Way Act 2000 (2000), HMSO.

Defra (2007) *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*, Defra.

Directive 2009/147/EC of the European Parliament and of the Council (2009).

Environment Act (1995), HMSO.

Highways England (2019) *Design Manual for Roads & Bridges, LA 105 Air Quality*, Highways England.

HMSO (2010) 'The Conservation of Habitats and Species Regulations 2010 Statutory Instrument 490'.

National Parks and Access to the Countryside Act (1949), HMSO.

National Planning Policy Framework (2012), DCLG.

Natural Environment and Rural Communities Act (2006), HMSO.

Pegasus Group (2020) '(Draft) Construction Traffic Management Plan'.

The Council of European Communities (1992) 'European Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora'.

The European Parliament and the Council of the European Union (2009) 'Directive 2009/147/EC of the European Parliament and of the Council'.

Welsh Government (2016) 'Environment (Wales) Act'.

Welsh Government (2019) 'The Clean Air Plan for Wales'.

Wildlife and Countryside Act (1981), HMSO.

6 Glossary

AADT	Annual Average Daily Traffic
AQC	Air Quality Consultants
AW	Ancient Woodland
CROW	Countryside and Rights of Way Act
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
EU	European Union
HGV	Heavy Goods Vehicle
HMSO	Her Majesty's Stationary Office
IAN	Interim Advice Note
kph	Kilometres Per hour
LDV	Light Duty Vehicles (<3.5 tonnes)
LGV	Light Goods Vehicle
LNR	Local Nature Reserve
µg/m³	Microgrammes per cubic metre
NO₂	Nitrogen dioxide
NO_x	Nitrogen oxides (taken to be NO ₂ + NO)
NPPF	National Planning Policy Framework
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PPW	Planning Policy Wales
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest

Standards A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal

TAN Technical Advice Note

7 Professional Experience

Dr Ben Marner, BSc (Hons) PhD CSci MEnvSc MIAQM

Dr Marner is a Technical Director with AQC and has over 20 years' experience in the field of air quality. He has been responsible for air quality and greenhouse gas assessments of road schemes, rail schemes, airports, power stations, waste incinerators, commercial developments and residential developments in the UK and abroad. He has been an expert witness at several public inquiries, where he has presented evidence on health-related air quality impacts, the impacts of air quality on sensitive ecosystems, and greenhouse gas impacts. He has extensive experience of using detailed dispersion models, as well as contributing to the development of modelling best practices. Dr Marner has arranged and overseen air quality monitoring surveys, as well as contributing to Defra guidance on harmonising monitoring methods. He has been responsible for air quality review and assessments on behalf of numerous local authorities. He has also developed methods to predict nitrogen deposition fluxes on behalf of the Environment Agency, provided support and advice to the UK Government's air quality review and assessment helpdesk, Transport Scotland, Transport for London, and numerous local authorities. He is a Member of the Institute of Air Quality Management and a Chartered Scientist. Dr Marner is a member of Defra's Network of Evidence Experts and a member of Defra's Air Quality Expert Group.

Dr Denise Evans, BSc (Hons) PhD MEnvSc MIAQM

Dr Evans is an Associate Director with AQC, with more than 20 years' relevant experience. She has prepared air quality review and assessment reports for local authorities, and has appraised local authority air quality assessments on behalf of the UK governments, and provided support to the Review and Assessment helpdesk. She has extensive modelling experience, completing air quality and odour assessments to support applications for a variety of development sectors including residential, mixed use, urban regeneration, energy, commercial, industrial, and road schemes, assessing the effects of a range of pollutants against relevant standards for human and ecological receptors. Denise also has experience of completing assessments for the purposes of Permit applications. She has acted as an Expert Witness and is a Member of the Institute of Air Quality Management.

Dr Frances Marshall, MSci PhD AMEnvSc AMIAQM

Dr Marshall is a Consultant with AQC, having joined the company in September 2016. Prior to joining AQC, she spent four years carrying out postgraduate research into atmospheric aerosols at the University of Bristol. Dr Marshall has experience preparing air quality assessments for a range of projects, including residential and commercial developments, road traffic schemes, energy centres, energy from waste schemes and numerous power generation schemes. She has experience in producing air quality assessments for EIA schemes, and has also assessed the

impacts of Local Plans on designated ecological areas, prepared Annual Status Reports for Local Authorities, and undertaken diffusion tube monitoring studies. She is an Associate Member of both the Institute of Air Quality Management and the Institute of Environmental Sciences.