

Siôn M. Williams
Cyngorydd - Cynllunio Datblygu / Advisor - Development Planning
Cyfoeth Naturiol Cymru / Natural Resources Wales

27th August 2021

Dear Siôn,

Solar park and battery storage facility on

LAND TO THE NORTH OF THE FORMER MAELOR GAS WORKS, WREXHAM

NRW ref: CAS-159593-COF7 - LPA ref: P/2021/0676

1 *Background*

Thank you for your letter of 23rd August 2021 providing the NRW comments on the documents most recently submitted to NRW. This letter is a response to the comment made by the Flood Risk officers.

The principal concern of the officers is the potential impact of the proposed development on flood levels off site – the on-site impacts having been mitigated by elevation of solar panels in specific locations:

- Adjacent to the solar site (north of Field 2 & west of Field 1a)
- Near the Mainetti building, west of the Site

These are considered separately in the remainder of this letter

We appreciate the detailed review that has taken place – especially in view of the lengthy and complex history of the modelling and the associated model variants.

2 *Adjacent to the solar site (north of Field 2 & west of Field 1a)*

The increases within the red line boundary have been discussed within the Revised FCA. For clarity and as suggested, the blue line boundary has been shown on Figure A-1; this is for Innova. The application was submitted in the name of NRS (part of the Innova Group as noted at <https://www.novus-rs.co.uk/>) and notice was served on Innova as the landowner and on Wrexham Solar Park Limited as the operator of the solar farm.

The maximum increase in levels occurs within the area of solar panels; this is generally between 0.02 and 0.04 m for (Floodplain Node 2) for the 1% and 0.1% AEP respectively (Tables 4-2 and 4-3 of the FCA v2i_210514) with an absolute grid/node maximum of 0.08 m. The increase in flood levels declines as one moves away from the area of solar panels notably towards the River Clywedog. The increase in river levels for the 1%CC AEP is shown in Table 4-4 reproduced below. This is a maximum of 0.008 m (8 mm) for river node CLWY1992 but is quite localised.

Since:

- this is within the ownership boundary and
- the modelling assumptions are quite conservative and
- the affected land could never be subject to a high vulnerability use

we would argue that such increases are acceptable and that **no further mitigation is required**.

Figure 4-5: Location of the “river” model nodes.

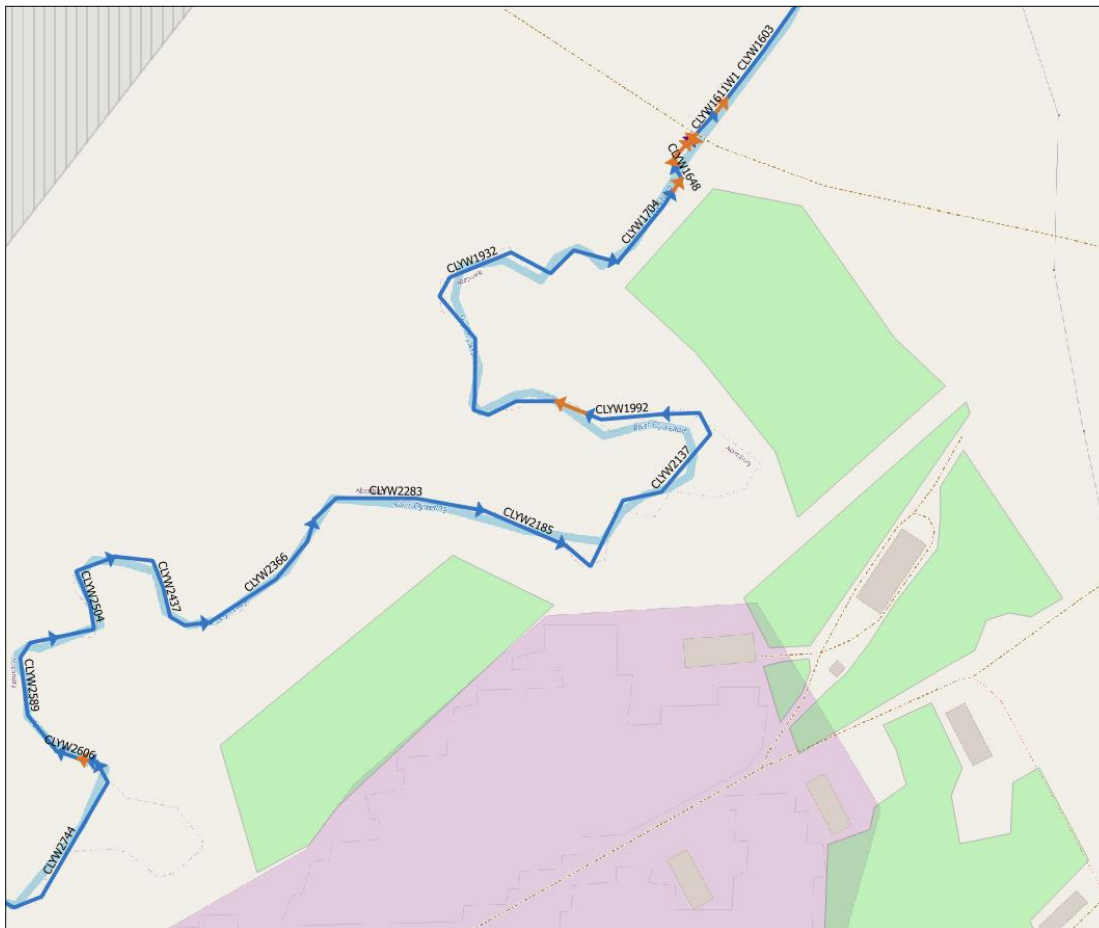


Table 4-4: Modelled channel flood levels (1% CCAEP)

Node Label	Baseline (mAOD)	Post development (mAOD)	Difference (Post dev – baseline) (m)
CLYW2366	25.948	25.948	0.000
CLYW2283	25.842	25.843	0.001
CLYW2185	25.634	25.637	0.003
CLYW2137	25.511	25.511	0.000
CLYW1992	24.946	24.954	0.008
CLYW1932	24.748	24.755	0.007
CLYW1704	24.372	24.373	0.001
CLYW1648	24.339	24.339	0.000
CLYW1634W	24.315	24.315	0.000

3 *Near the Mainetti building, west of the Site*

The captioned location is some 250 m upstream of any of the proposed interventions in the floodplain (solar panels) a distance which includes a significant afflux due to the causeway and bridge opening to the north of the existing solar farm.

It is implausible, hydraulically, that the proposed intervention of solar panels could lead to such a profound impact that is so remote from the intervention and with negligible impact in the intervening channel and floodplain. This is especially so, given the detailed presentation of the limited impacts of the interventions described within the FCA.

It is, though, rather confusing that the map in the FCA showed increases at the captioned locations. These increases are due to two factors:

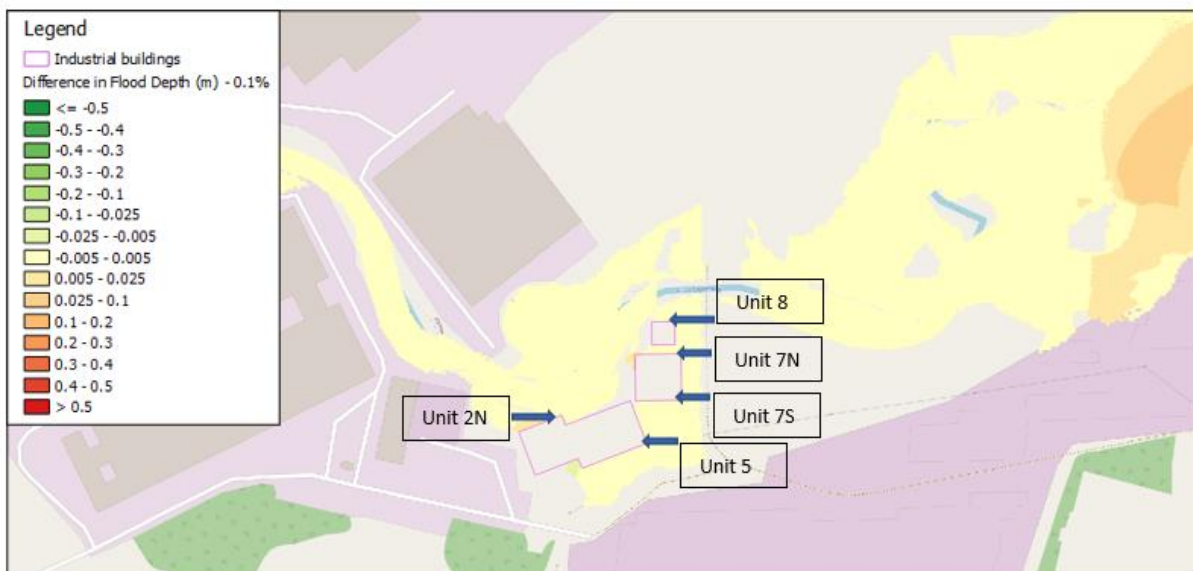
- Firstly, in the interests of economy, we have undertaken post-development model runs for two planning applications jointly. The applications are the captioned solar farm and that for an industrial development on land to the west of the causeway.
- Secondly, the increases that are shown are due to model instability that is due to an erratic bed profile of the River Clywedog at that location.

Further modelling has been undertaken during 2021 for the adjacent (Industrial) Site, in line with **Version “C”** as per Table 1-1 from the FCA (v2i_210514), reproduced below. This modelling work has not yet been submitted; however, the work completed thus far has investigated the unusual channel configuration in this section of the model. The helpful comments made by NRW on the model and our response are shown in Table B-1. Modifications have been made to the model which lead to flood level differences of <0.005 m (5 mm), as shown below in Figure 4-7 of the draft FCA for the Industrial Site.

This confirms that the proposed solar development (nor the Industrial Development) would have **no practical impact on flood levels near the Mainetti factory**, a conclusion which accords with the hydraulics of the Site.

Table 1-1: Versions of Hydraulic Model for River Clywedog

Date	Version	Comment
June 2020	A	Baseline modelling described in Report v1 based on hydrology for Bowling Bank GS.
Feb 2021	B	Revised baseline and post-development modelling for solar farm described in v2 of Report using scaled hydrology for Bowling Bank and taking account of NRW comments.
May 2021	B*	Revised post-development modelling for solar farm described in this Report using scaled hydrology for Bowling Bank and taking account of further NRW comments. The baseline model report was not revised at this point.
Summer 2021	C	The model will be further revised based on revised hydrology at the Site and comments by NRW and presented as a flood map challenge alongside the FCA for the proposed industrial development on an adjacent Site. [not yet submitted]

Figure 4-7: Change in flood levels due to development (0.1% AEP)

4 Summary

This letter is a response to comments made by the NRW in relation to an FCA and associated hydraulic model for the proposed development of a solar farm. It has reviewed the potential increases at two off-site locations.

The findings are that:

- i. The site ownership includes land on both banks and accordingly, there are no potential impacts on third parties.
- ii. There are no significant (i.e. > 5 mm) increases in the peak levels for the River Clywedog save in a short stretch covered by 2 model nodes. Given their localised nature and the conservative modelling strategy, further mitigation is not warranted.
- iii. The increases that have been shown in the FCA for a location adjacent to the Mainetti factory result from model instability issues that have been addressed in a subsequent version (C) of the hydraulic model. They cannot, in any case, be hydraulically linked to the proposed development and are of no relevance to this FCA.

I trust that this is a sufficient response for your colleagues. Please do not hesitate to contact me if you should require further information.

Yours sincerely,

P Webster

Dr Paul Webster, BSc, MSc, DIC, PhD, FCIWEM, C.WEM

for Corylus Planning & Environmental Ltd

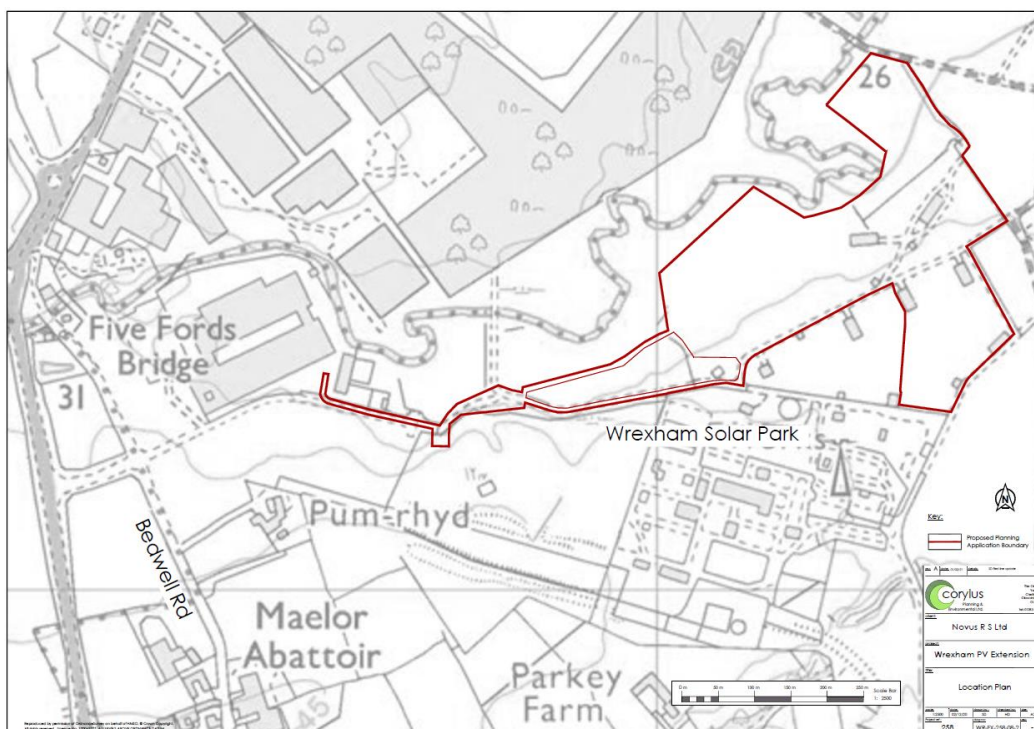
pw@corylus-ltd.co.uk 07748 187 110

Appendix A Site boundary

Figure A-1: Innova Wrexham Property Holdings Limited Ownership



Figure A-2: Location plan with red line boundary



Appendix B Extract from draft Flood Map Challenge Report for the adjacent (Industrial Site) – not yet submitted

Table B-1: Response to NRW Comments on Flood Model (extract)

Ref	<i>Comment (italics) & response in green</i>
HM3	<i>The weir structures used for stability are affecting the representation of the open channel immediately upstream. For example: Geometry of channel CLYW3691 is interpolated with 80% from CLYW3691.csv and 20% from CLYW3650.csv - Not utilising the cross-section survey from CLYW3667.csv.</i> • Cross sections were included upstream of the weirs. Geometry of channel is interpolated with 50% now. <i>Additionally, the bed slope from the survey (CLYW3691.csv to CLYW3667.csv) is -2.24%. The CLYW3691 has been modelled with a bed slope of +0.25%.</i> • The slope change is due to the change in bed level of the cross section, which can be seen in the Figure below. <i>Geometry of channel CLYW3650 is interpolated with 91% from CLYW3650.csv and 9% from CLYW3566.csv - Not utilising the cross-section survey from CLYW3633.csv.</i> • Cross sections were included upstream of the weirs. Geometry of channel is interpolated with 50% now.
HM4	<i>Inclusion of CLYW3566B.csv has changed the bed slope of open channel section CLYW3566 to 0% from -0.38% (slope between surveyed section CLYW3633.csv and CLYW3504.csv).</i> • This is due to the bed level of the cross section CLYW3504 is higher than the cross section CLYW3566, which can be seen in the Figure below.

