

Lamby Way Solar Farm cable connection: Water Framework Directive Assessment

A REPORT FOR WALTERS UK LTD



Document Control

Title

Lamby Way Solar Farm cable connection: Water Framework Directive Assessment

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WALTERS



Reference

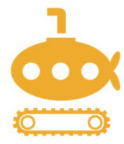
P19121R2

Status

Final

Document Control

Document Reference	Issue Date	Comments	Written by	Approved by
P19121R2	October 2019	First Issue	GRO	GRO



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1 Introduction

1.1 REPORT CONTEXT

Cardiff City Council (CCC) have received planning permission to create a solar electricity generation scheme on the Lamby Way landfill site in east Cardiff. It is intended that this be connected to the nearby Welsh Water Wastewater Treatment Facility on Rover Way, Cardiff in order that electricity generated can be directly provided to Welsh Water.

In order to connect the two sites, a new cable route is required. The preferred route for this is to run in a shallow buried duct on the landward side of Rover Way before crossing beneath both Rover Way and the River Rhymney, returning to the shallow sub-surface in the isthmus of land that extends across the mouth of the River Rhymney adjacent to the Lamby Way site.

In order to cross beneath the River Rhymney, a programme of directional drilling is proposed. As this work will pass beneath the tidal environment, a Marine Licence is required.

With the exception of the directional drilling aspect, all other works lie outside of the marine zone, above the Mean High-Water Strings (MHWS).

CCC have employed Walters (UK) Ltd (Walters) to undertake a process of design and implementation of the new cable route. As part of the design process, Walters have engaged Yellow Sub Geo to manage the process of collating and submitting an application for a Marine Licence. This report addresses the need for an assessment of

the potential impact of the works under the Water Framework Directive.

The solar farm to which this cable route forms an ancillary part was granted planning permission in 2019, CCC reference 19/00397/MJR). However, this cable route was not part of the development at that juncture, and so will require further planning permission. CCC are compiling a planning application for submission in due course.

Notwithstanding the above, many of the ecological assessments undertaken in support of the planning application for the solar farm also address the same issues that are salient to these additional cable installation works. In particular, a Habitats Regulation Assessment was undertaken by Arcadis (2019)¹.

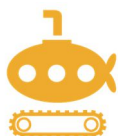
1.2 PROPOSED WORKS

The proposed new cable route involves several aspects along its proposed alignment. This report only contemplates those works that affect the marine environment, namely those involved in the delivering directional drilling process only.

The launch and receiving pits for the drilling will both be above MHWS, with the borehole then being directionally drilled beneath the bed of the tidal river mouth between these two points. The two landward works areas will be securely fenced within a compound and managed as construction sites.

The site location is shown relative on Figure P19121_R1_01. The approximate proposed position of the planned launch and receiving pits are indicated on Figure P19121_R1_02. The approximate National Grid Reference of these two works compounds are:

¹ Arcadis, 2019. Statement to inform an Appropriate Assessment. Version 3. April 2019



- Launch pit: ST 22076 77596
- Receiving pit: ST 21818 77269

In broad terms, this work will comprise;

- Set-up of two works compounds, either side of the proposed river crossing route. The first of these is the drilling compound, the second is the receiving compound.
- Excavation of a pit in each location, providing the drilling rig with a suitable point of access and suitable point of exit from the sub-surface.
- Drilling of a small diameter (circa 500 mm) pilot bore along the proposed alignment, some 12 m beneath sea level at its deepest. See Figure P19121_R1_03 for indicative details.
- Once the drill string exits from the receiving pit, the drill head is swapped for a reaming head and the drill string drawn back through the pilot hole, reaming out to a larger diameter.
- As the reaming head is withdrawn, an HDPE borehole liner is drawn back through the borehole, providing the permanent casing to the borehole.
- Once the borehole liner is in place, two 150 mm HDPE ducts will be drawn through the borehole liner annulus, providing a duct for an 11kV electricity cable and a fibre-optic communications cable respectively.

1.3 REPORT SCOPE

This report provides an assessment of the impact that the proposed works may have on the immediate water body and any linked water bodies and whether the proposed works comply with the river basin management plan (RBMP). The aim of the report is to determine

whether the proposed works will affect the environmental objectives of the WFD, which are;

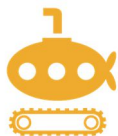
- to prevent deterioration of the status of surface waters and groundwater;
- to achieve objectives and standards for protected areas;
- to aim to achieve good status for all water bodies or, for heavily modified water bodies and artificial water bodies, good ecological potential and good surface water chemical status;
- to reverse any significant and sustained upward trends in pollutant concentrations in groundwater;
- attain the cessation of discharges, emissions and losses of priority hazardous substances into surface waters;
- progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants.

The Severn River Basin Management Plan (EA/ NRW 2015)² provides water body objectives and this document assesses the potential impact that the proposed works may have on attaining these objectives.

EA/ NRW 2015 also discusses the Severn Estuary European Marine Sites (EMS, comprising the Severn Estuary Special Area for Conservation, Severn Estuary Special Protected Area and Severn Estuary RAMSAR sites) as of critical importance. An assessment of the impact of the proposed works on the Severn Estuary EMS has already been presented in Yellow Sub Geo (2019)³ and is not reproduced herein.

² EA/ NRW 2015, Severn river basin management plan. Part 1

³ Yellow Sub Geo 2019. Lamby Way solar farm cable connection: Marine Application Supporting Information.



2 The water body

2.1 CURRENT WATER BODY STATUS

The estuarine waters of the River Rhymney form part of the Severn Lower transitional waterbody in Natural Resources Wales' (NRW) Water Framework Directive Cycle 2 mapping (NRW, 2018⁴). The waterbody has the following status in 2018 (the most recent cycle of assessment presented by EA/ NRW):

Table 2-1 Current (2018) water body status

Overall waterbody status	Moderate
Ecological status	Moderate
Chemical status	Fail
Driver for ecological status	Angiosperms
Physico-chemical quality elements	Good
Fish status	Good
Invertebrate status	Good
Hydromorphological supporting elements	Not assessed
Saltmarsh status	Moderate
Seagrass status	Good

The Lower Severn covers a vast area of intertidal and estuarine environments around the Severn Estuary, of which the mouth of the River Rhymney is a very small part.

2.2 WATER BODY OBJECTIVES

The objectives for the water body are set out in EA/ NRW 2015a⁵ as an appendix to the River Basin Management Plan (EA/ NRW 2015). These are reproduced below:

Table 2-2 Severn Lower Status objective for 2027 (EA/ NRW 2018)

Overall waterbody status	Good
Ecological status	Good
Chemical status	Good
Physico-chemical quality elements	Good
Fish status	Good
Invertebrate status	Good
Hydromorphological supporting elements	Not assessed
Saltmarsh status	Good
Seagrass status	Good

⁴ NRW, 2018. Water Watch Wales website, <https://waterwatchwales.naturalresourceswales.gov.uk/en/> accessed October 2019

⁵ EA/ NRW 2015a. WFD Water Bodies in England: 2015 status and objectives for the update to the river basin management plans - Cycle 2

3 Screening and scoping

3.1 SCREENING

The proposed works do not fall within works categories that do not require a WFD assessment. As such, the assessment was taken forward to scoping stage.

3.2 SCOPING

Guidance requires that the WFD assessment consider the following receptors;

- hydromorphology;
- biology – habitats;
- biology – fish;
- water quality and;
- protected areas.

An assessment is also required if there is a risk of introducing invasive non-native species through the proposed works.

In considering whether impact to each of these receptors should be assessed within the scope of this document, the nature of the proposed works and their interaction with the transitional/ estuarine/ intertidal environment was considered. Of particular importance are the following factors:

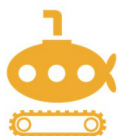
- 1) The above-ground footprint of the proposed works falls entirely outside of the estuarine/ intertidal zone.
- 2) No hard infrastructure is proposed within or immediately adjacent to the estuarine/ intertidal zone.
- 3) Upon completion of the works the topsoil and natural environment will be reinstated.

- 4) The works period will be short – up to 5 weeks, albeit longer than a single spring-neap tidal cycle.

In light of these factors, the potential impact on each of the receptors is discussed in the following table and used to determine whether an assessment is scoped into this document. Section 4 provides an assessment of impacts on those receptors scoped into the assessment:

Table 3-1 Scoping summary

Receptor	Comment	Assessment required?
Hydromorphology	Works above ground are entirely outside of estuarine/ intertidal area.	No
Biology - habitats	Works above ground are entirely outside of estuarine/ intertidal area but within 500 m of higher sensitivity habitat (saltmarsh).	Yes
Biology - fish	Works above ground are entirely outside of estuarine/ intertidal area.	No
Water quality	Some small potential for run-off from construction compound into estuarine environment	Yes
Protected areas	Works within 50 m of Severn Estuary EMS	Yes
Invasive non-native species	Works not within estuarine/ intertidal zone and does not involve materials with potential to introduce invasive non-native species.	No



4 Impact assessment

4.1 PROTECTED AREAS

A separate document (*Lamby Way solar farm cable connection Marine Licence Application: Supporting Information, Yellow Sub Geo 2019*) has been drafted in support of the Marine Licence Application that assesses the potential impact of the proposed works on the Severn Estuary EMS and sets out proposed mitigation to address impacts. The reader is directed to this separate document for further detail on the assessment of this impact.

4.2 BIOLOGY – HABITATS

The separate document titled *“Lamby Way solar farm cable connection Marine Licence Application: Supporting Information, Yellow Sub Geo 2019”* includes an assessment of the potential impacts of the proposed works and the nearby saltmarsh habitat as part of the wider Severn Estuary EMS. The reader is directed to this separate document for further detail on the assessment of this impact.

4.3 WATER QUALITY

Section 3.3.2 of the separate document titled *“Lamby Way solar farm cable connection Marine Licence Application: Supporting Information, Yellow Sub Geo 2019”* sets out the potential impacts to water quality within the Severn Estuary EMS and a proposed range of mitigation to address this risk. The reader is directed to this separate document for further detail on the assessment of this impact.

4.4 CONCLUSIONS

An assessment of the potential impact of the proposed works on the receptors of the Severn Estuary EMS has been drafted in the separate document titled *“Lamby Way solar farm cable connection Marine*

Licence Application: Supporting Information, Yellow Sub Geo 2019”. This assessment addresses potential impacts to the Protected Area, the habitats within it and the water quality that sustains it. As such, the same assessment is considered to address the receptors that have been scoped into this WFD Assessment.

The proposed works are relatively small scale and of small duration. Works within the estuarine/ intertidal zone are limited to underground drilling works only. The only surface works will sit entirely outside of the estuarine/ intertidal area. However, the close proximity of the eastern works compound to the saltmarsh and mudflat habitats of the Severn Estuary EMS has led to the identification of a range of potential impacts. Mitigation is set out within the Supporting Information document to address these impacts, including;

- no working through the winter season, to avoid impacts on overwintering bird populations;
- the use of acoustic barriers to screen the Severn Estuary EMS from any noise generated;
- design and implementation of a Construction Environmental Management Plan to control risk of impacts from construction-phase activities and;
- reinstatement of the works compounds to the status quo upon completion of the works.

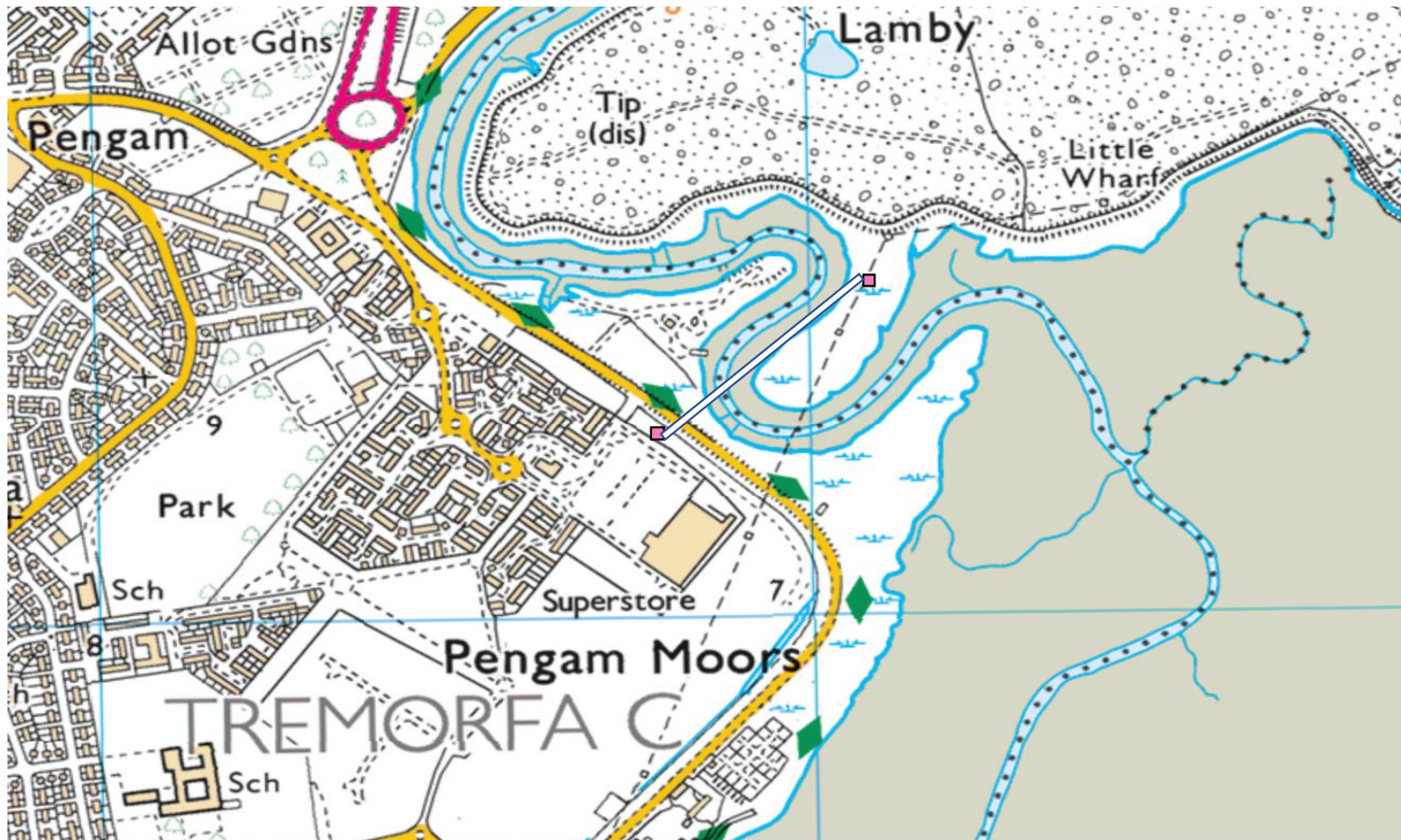
The reader is directed to the Supporting Information document for more details.

In the light of these mitigation measures, it is considered that residual impacts will be reduced to a negligible level. As such, it is concluded that the works will neither affect the current status of the water body nor prevent the attaining of future objectives for the water body status.



Figures





KEY:



Approximate drill pit compound locations



Approximate alignment of bored tunnel



7 Neptune Court, Vanguard Way,
Cardiff, CF24 5PJ
helpme@yellowsubgeo.com

Drawing Title	Site Location Plan	Scale	NTS
Drawing Number	P19121_R1_D01	Revision	0
Project Name	Cable connection, Lamby Way Solar	Drawn by	GRO
Project Number	P19121	Checked by	ACE
Client	Walters UK Ltd	Notes	All locations approximate only

YELLOW
SUB
GEO



KEY:



Approximate drill pit compound locations



Approximate alignment of bored tunnel

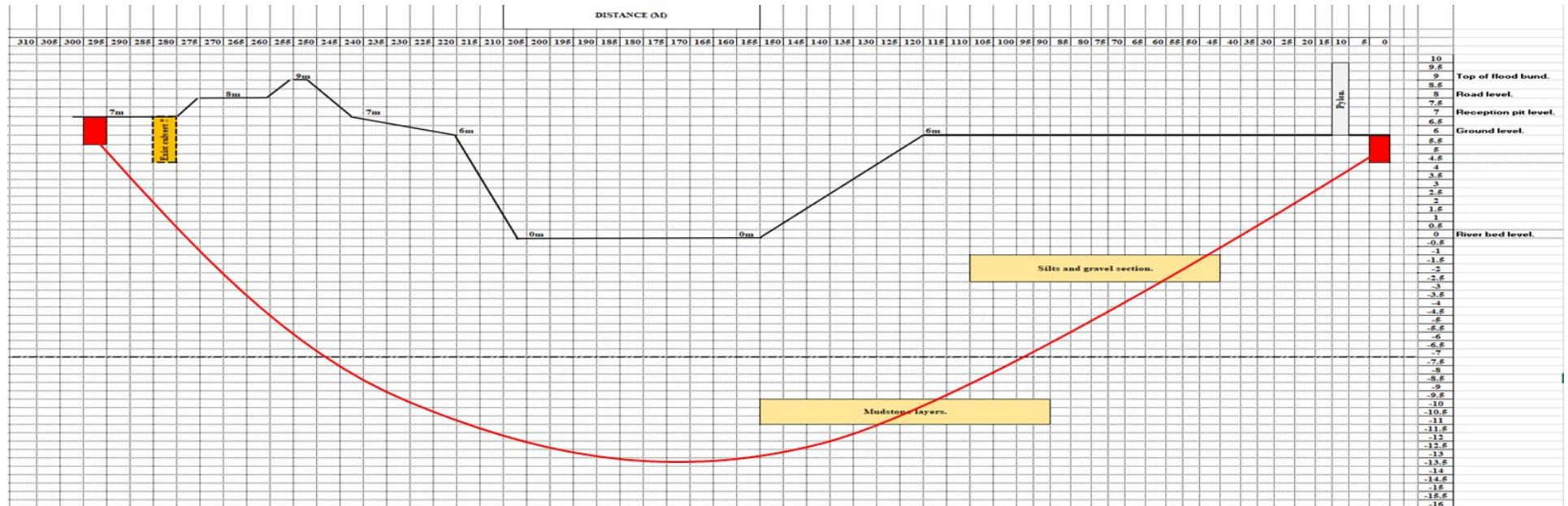


Severn Estuary SAC


7 Neptune Court, Vanguard Way,
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Drawing Title	Proposed site layout plan	Scale	NTS
Drawing Number	P19121_R1_D02	Revision	0
Project Name	Cable connection, Lamby Way Solar	Drawn by	GRO
Project Number	P19121	Checked by	ACE
Client	Walters UK Ltd	Notes	All locations approximate only

YELLOW
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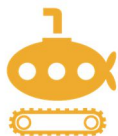


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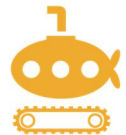
Drawing Title	Indicative cross section	Scale	NTS
Drawing Number	P19121_R1_D03	Revision	0
Project Name	Cable connection, Lamby Way Solar	Drawn by	GRO
Project Number	P19121	Checked by	ACE
Client	Walters UK Ltd	Notes	All locations approximate only

YELLOW
SUB
GEO

Appendices



Appendix A: Report Conditions



Report Conditions

This report has been prepared by Yellow Sub Geo Ltd. (Yellow Sub Geo) in its professional capacity as soil and groundwater specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client, and is provided by Yellow Sub Geo solely for the internal use of its client.

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Site investigation results necessarily rely on tests and observations within exploratory holes only. The inherent variation in ground conditions mean that the results may not be representative of ground conditions between exploratory holes. Yellow Sub Geo take no responsibility for variation in ground conditions between exploratory positions.

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