

# Awel y Môr Offshore Wind Farm

## Category 6: Environmental Statement

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## Contents

1. Executive Summary .....	4
2. Introduction.....	6
3. Design Refinement and Updated BRAG Process overview .....	7
4. Project refinement .....	9
4.1 Offshore cable corridors .....	9
4.2 Landfall.....	10
4.3 Onshore cable corridors .....	11
4.4 Onshore substation.....	13
5. Updated BRAG and identification of preferred options .....	14
5.1 Offshore Cable Corridor .....	14
5.2 Landfall.....	15
5.3 Onshore Cable Corridor.....	17
5.3.1 Summary BRAG.....	17
5.3.2 Conclusion .....	25
5.4 Onshore Substation .....	26
5.4.1 Summary BRAG.....	26
5.4.2 Conclusion .....	35
6. Conclusion .....	36
7. Appendices .....	40

## 1. Executive Summary

This document has been prepared to update Awel y Môr Offshore Wind Farm Stakeholders on the outcomes of the site selection process since the short list consultation undertaken in May 2020. At this point, stakeholders were provided with a report and a mapping tool to review the shortlisted options for the offshore and onshore transmission assets. Feedback was provided either via an online survey, email or a telephone conference call. Responses were compiled and reviewed during a project team workshop organised by RWE and along with additional technical information were used to identify a list of 'preferred options' which are presented herein.

RWE is undertaking habitat surveys across the preferred options this year and will use this information along with the outcomes of wider public consultation undertaken and additional engineering studies in Q4 2020 to identify a single preferred route.

This document sets out the process that has been undertaken over the last three months to arrive at the preferred options, and details those options.

### *Refinement*

A refinement exercise was carried out to reduce the elements of the project down to the parameters required for the EIA phase of the project. Offshore cable corridors were refined to 1km width and onshore cable corridors were refined to 100m width (or wider for certain areas). The landfall parameters remain as before the short list consultation with a wider area (fan) at the landfall of each onshore cable corridor to accommodate flexibility in the landfall design. The substation zones also remain as before the short list consultation.

Further detail on the refinement process can be found in section 4.

### *BRAG*

The BRAG (Black - Red – Amber – Green) assessment of the short list areas was updated with feedback provided by Stakeholders and with the outputs from additional technical studies that were undertaken. An RWE project team workshop was held to review the updated BRAG and assess which of the shortlisted options should progress to the next phase of consultation.

The detail behind the process and outcomes of the BRAG review can be found in section 5.

### *Next Steps*

Over the course of the next few months, engagement activity on the preferred options will commence. Views on the preferred options will be sought from the

public as part of the project's first informal round of stakeholder engagement and again from key stakeholders through the ETG process. The information gathered from these interactions and early results from environmental surveys will help define the single option to be taken forward to statutory consultation.

The following diagram sets out the site selection process that has been undertaken to date and the next steps.

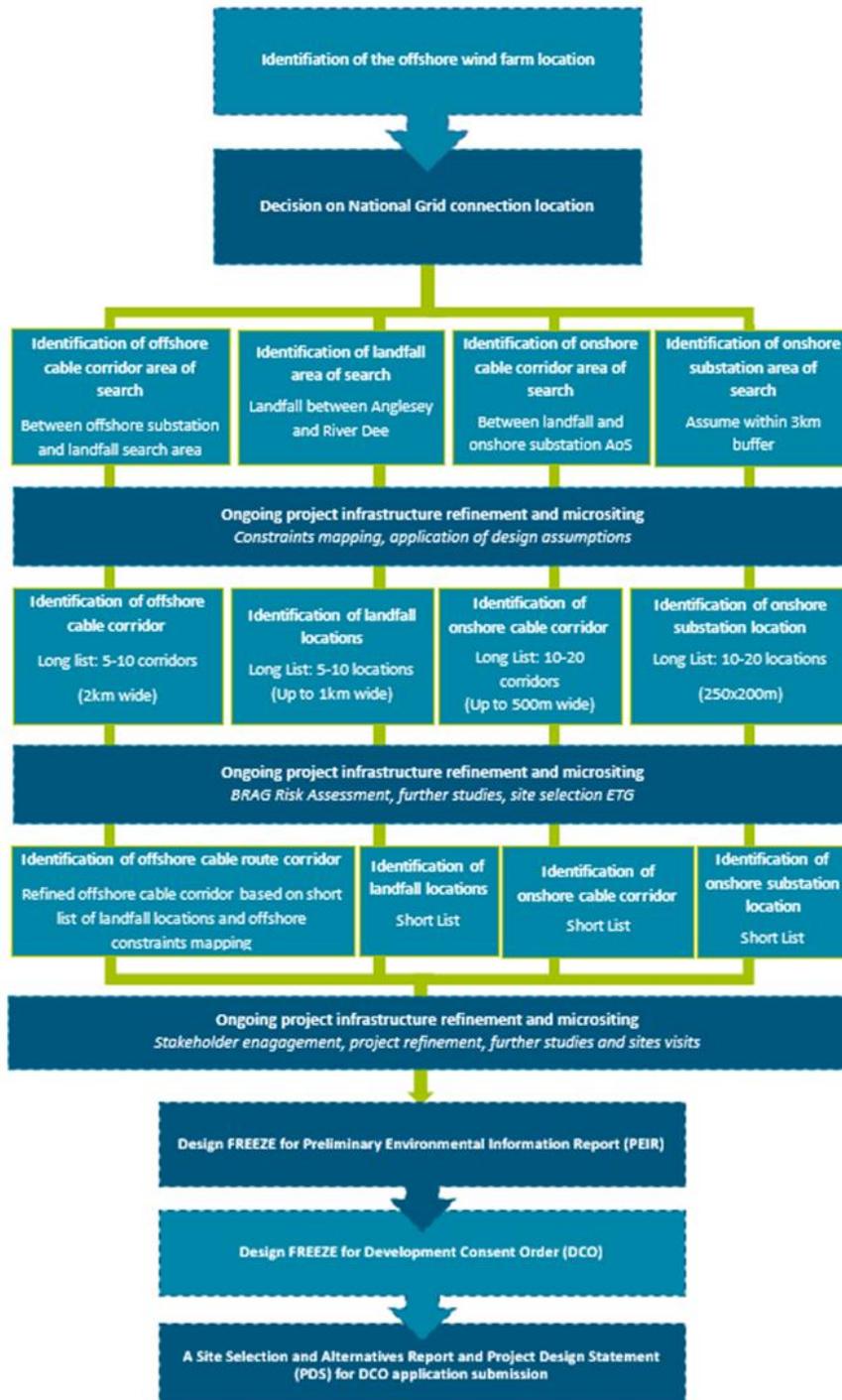


Diagram 1. Site selection process.

## 2. Introduction

This report summarises the refinements made to the Awel y Môr Offshore Wind Farm electrical transmission infrastructure options (cable routes, landfalls and project substation locations) following a Stakeholder consultation exercise involving the project's Expert Topic Group (ETG) Members in May 2020. The report describes subsequent additional technical work that has been undertaken since the consultation, in order to refine and select a set of preferred options.

Consultees were provided with a report (Awel y Môr Offshore Wind Farm. The Site Selection Process: Identification of a Short List of Options), an online mapping tool, an electronic survey link and an opportunity for the ETG members to discuss the options with the Awel y Môr team in more detail on either a group or individual call.

The outcomes presented in this report are the result of careful consideration of feedback provided by Stakeholders and further BRAG (Black-Red-Amber-Green) analysis undertaken by Royal Haskoning DHV and RWE.

The purpose of this report is:

- To share the further refinement that has been undertaken on the short list of options since the consultation exercise in May 2020
- To present at a high level the work which has been undertaken to identify the preferred landfalls, corridors and substation zones and the reasons why the other shortlisted options have been deselected.

## 3. Design Refinement and Updated BRAG Process overview

Following Stakeholder Consultation undertaken in May involving the project's ETG members, responses from Stakeholders have been reviewed and added to the project BRAG assessment. Consultees were provided with a report (Awel y Môr Offshore Wind Farm. The Site Selection Process: Identification of a Short List of Options), an online mapping tool, an electronic survey link and an opportunity for the ETG members to discuss the options with the Awel y Môr team in more detail on either a group or individual call.

The following stakeholders provided feedback on the short list options via the questionnaire:

- NRW;
- Gwynedd Council;
- Conwy Council;
- Cadw;
- North Wales Wildlife Trust;
- Welsh Government;
- CPAT;
- Trinity House;
- Royal Yachting Association;
- RSPB; and
- North and Mid Wales Trunk Road Agent (NMWTRA).

A teleconference call was subsequently held on 1st June 2020 with stakeholders to discuss the details and process outlined within "The Site Selection Process: Identification of a Short List of Options". The following stakeholders were represented on the call:

- Sefton Council;
- Conwy Council;
- NRW;

- RSPB; and
- Denbighshire County Council.

RWE has also undertaken a number of technical studies to support the refinement including further work on the engineering solutions required for the project, understanding constraints presented by existing utilities and other crossings and further consideration of the likely visual and landscape impacts.

## 4. Project refinement

Following the stakeholder engagement and further studies described in section 3 above, a design refinement exercise was undertaken on the short list of options. Refinement was carried out with the aim of reducing the short listed options down to the parameters required by RWE for a project design for the next stage of the Environmental Impact Assessment (EIA). During the site selection process, RWE identified that the following parameters were required for the project design for the next stage of the EIA:

- Offshore cable corridor – 1km width (with wider corridors for optionality at key locations);
- Landfall – no change to parameter set (previously shared during the long list consultation - transition bay dimensions 50x30m, landfall HDD compound 300x150m);
- Onshore cable corridor – 100m width (with wider corridors for optionality at key locations); and
- Onshore substation – 250m x 200m operational footprint and a 250 x 150m construction footprint.

As a consequence, the offshore cable corridors have been reduced from 2km to 1km in width, and the onshore cable corridors from 500m to 100m in width. These are the parameters of the preferred options that will be considered in more detail in order to identify the single option to be taken to statutory consultation.

To amend the short listed options down to these parameters, a full review of the cable corridor options was carried out to ensure that the optimal position of each refined corridor was identified.

### 4.1 Offshore cable corridors

The offshore cable corridors were reduced to a 1km width by initially identifying the shortest route from the Array Agreement for Lease (AFL) area to the landfall within the existing 2km corridors. Environmental constraints were also mapped to ensure that the optimal route involved avoiding constraints and causing the least environmental impact. Engineering requirements were considered to ensure the options retained the maximum design flexibility at this stage of the route selection process.

The following key decisions were made in determining the final location of each refined route:

- All corridors were designed to ensure that cables could connect into any part of the AfL area, as the precise location of the offshore substation platform(s) has not yet been determined. Therefore, corridors have retained a wide 'fan' as they reach the AfL area to allow cables to connect into any point.
- The western cable corridors have been kept wider (approximately 4km in width) as they cross Constable Bank Annex I sandbank, in order to retain future flexibility for crossing the sandbank at the most acceptable / optimal location if required. Further route refinement in this area will follow the conclusion of a geophysical survey (currently ongoing; commenced in Q2 2020).
- Option East B has been split into a 'North' (East B(N)) and 'South' (East B(S)) option, to route around the Eirgrid interconnector north of Rhyl Flats Offshore Wind Farm. The East B(N) option connects into the east of the AfL area, and the East B(S) connects into the West of the AfL area, ensuring that all parts of the AfL area are still accessible.
- Option East B(S) encounters a pinch point between the Eirgrid interconnector and Rhyl Flats Offshore Wind Farm, and therefore the cable corridor is reduced to approximately 500m in width at this location.
- Options East A(i) and West D encounter a pinch point around the 250m buffer of a protected wreck site as they approach the North Wales coast.
- All corridors were narrowed compared to previous corridor options as they approach the North Wales coast, to reflect the realistic cable routing options from the landfalls out towards the AfL area.

See Appendix Figure 1 for the shortlisted Offshore corridors and Appendix Figure 2 for the refined corridors.

## 4.2 Landfall

Minor changes only were made to the short listed landfall options during the refinement process. The following key changes were made:

- Landfalls footprints were refined to show the feasible HDD 'funnel' across which cables could be installed during the landfall HDDs, this was identified using additional technical work that has been undertaken by RWE;
- In addition, a landfall construction compound 'search area' was identified for Landfalls 3, 4 and 5, in which the landfall construction compound could potentially

be located. This is to retain flexibility at this stage in terms of the final location of the landfall compound..

- Following additional technical assessment it was identified that Landfall 4 was feasible, but only if a long HDD with an offshore exit was used. A beach HDD exit was not viable due to the presence of the Rhyl Flats Offshore Wind Farm cabling in the nearshore. No amendments to the landfall footprint were made as a result of this constraint but it has future implications for any refinement of this option.

See Appendix Figure 3 for the Landfall locations

## 4.3 Onshore cable corridors

The following steps were undertaken to arrive at the refined short list of options for each onshore cable corridor:

- The shortest route from the landfall to the substation was identified;
- The 100m corridors avoided environmental constraints identified by Stakeholders as far as possible;
- Interaction with other environmental constraints, such as watercourses and hedgerow crossings, and routing through 500m separation buffers surrounding properties, was minimised as far as possible;
- It was assumed in the first instance that complex crossings (e.g. critical infrastructure, main rivers) would be subject to HDD, and the remainder of the routes would be crossed using open-cut trenching, unless specifically identified as suitable for and requiring HDD during the engineering assessment which will be undertaken before PEIR to assist in the selection of a single preferred option ;
- New information obtained during utilities searches was used to refine the corridors and reduce interactions;
- The corridors were narrowed to less than 100m in locations where a 100m corridor could not be achieved due to existing 'hard' constraints. The corridors were never reduced below the design parameter for a final corridor of 40m;
- The corridors were also widened in selected areas where flexibility could be required prior to further engineering assessment, for example in the location of a particularly sensitive HDD (e.g. across the River Clwyd, or across the A55 and the proposed Elwy Solar Energy Farm);
- Assuming other refinement requirements could be met, the corridors were aligned to field margins as far as possible.

Refining the onshore cable corridors down to 100m ensured that the options were presented in much greater detail than they appeared in the original short list. This refinement gave rise to a number of key changes to the appearance of the options. These changes are summarised below:

- New onshore substation cable corridors were created which connect the onshore cable corridors (these terminate at the edge of the onshore substation Area of Search (AoS)) to all short listed substation options and on to the proposed National Grid connection point.
- Due to the presence of key constraints identified along cable corridors, optionality has been retained through the use of sub options in certain places, namely;
  - 3c/4c - this corridor has been split into sub-options to provide alternatives that will be subject to further evaluation and high level environmental assessment.
  - 3b/4b/5a - to allow two options for HDD crossings across the St Asaph Business Park, due to the sensitivity of this area and constrained nature of the crossing in these locations.
  - 5c - to allow two options for entering the onshore substation AoS, due to the constraints posed by the River Elwy valley topography and presence of ancient woodlands.
- A wider corridor (>100m) has been retained around the crossing of the River Clwyd (option 5a) and the A55 at the proposed Elwy Solar Energy Farm (options 3b / 4b / 5a) in order to retain flexibility prior to further evaluation and high level environmental assessment.

Options 3a/4a presented a high risk associated with the crossing of two designated heritage assets, Kinmel Park and Bodelwyddan Castle Historic Parks and Gardens, including particular sensitive areas of each (for example, the location of Kinmel Park Camp and Bodelwyddan Castle First World War practice trenches). Consultation with Cadw and CPAT undertaken during site selection has underlined that open cut trenching through sensitive parts of these assets would be a key concern for these stakeholders. As this is a risk which can't be micro-sited around or subject to further mitigation to reduce this risk, this option has not been taken forward as part of the preferred options.

See Appendix Figure 4 for the Shortlist of options and Appendix Figure 5 for the refinement.

## 4.4 Onshore substation

The refinements to the onshore substation zones made at this stage of the process involved refining the potential zones to address constraints identified during the further studies and consultation.

Further information on the onshore substation zones and constraints impacting on the options can be found in section 5.4 below.

RWE is still considering and assessing the potential footprint locations and intends to continue consulting on wider zones rather than specific locations at this stage.

See Appendix Figure 6 for the shortlisted options (with indicative footprint and compound size shown for information only).

## 5. Updated BRAG and identification of preferred options

The BRAG assessment was updated where required and used to identify the preferred options. The BRAG assessment was reviewed against the refined short list of options, taking into account the findings from the further studies undertaken and Stakeholder feedback from the Short List Consultation. The key findings from the updated BRAG assessment are summarised in the following sections.

An additional option 3c/4c(iii) was originally included but discounted during the site selection process. This route crossed Kinmel Park Historic park and Garden but was found to be constrained by land issues surrounding the Cemex quarry. An additional call was held with relevant Stakeholders to discuss the potential for this option but through consultation and further investigation into land use it was discounted.

### 5.1 Offshore Cable Corridor

At this stage of the site selection process, RWE has identified one offshore cable corridor for each of the remaining three landfall options to the AfL area. These corridors will be included within the offshore geophysical survey (this commenced in Q2 2020).

Landfall 3 already connects to only one offshore cable corridor option, West C, within the refined options.

Landfall 5 also already connects to only one option, East B(N) / East B(S) at this stage. Both of the corridors described in this option – East B(N) and East B(S) – connect into different potential regions of the AfL area, and therefore both are retained within the option at this stage.

Landfall 4 connects to two options, East A(i) and West D, at this stage, and therefore a decision was made as to which of these options should be retained for inclusion in the offshore geophysical survey scope.

With the exception of cost, where East A(i) is potentially a more costly option, West D otherwise carries the greater risk of impacts on environmental constraints and engineering challenges, including multiple cable crossings, an additional sharp change in direction and the crossing of Constable Bank. While the risks associated with crossing the sandbank are identified as 'medium' and do not rule out routing

cables this way (West C, for example, also routes through Constable Bank), when compared with East A(i), West D carries a greater number and range of risks, and as such it is East A(i) which has been retained as the preferred option for Landfall 4.

RWE do not require further reduction in the number of the offshore cable corridors at this stage. Further site selection of the offshore corridors will be made based on the findings of the offshore geophysical survey, the landfall option selection, and environmental information that will be gathered on the preferred options..

Therefore, the following are the preferred options for the next stage of the refinement of the offshore cable corridor:

- West C;
- East A(i); and
- East B(N) / East B(S).

These options are shown in Appendix Figure 7.

## 5.2 Landfall

Key risks were identified with each of the remaining landfall options (Landfalls 3, 4 and 5) via the site selection process undertaken to date.

Landfall 3 represents the potentially shortest route between the AfL area and the onshore substation AoS, however this landfall is constrained by the existing Gwynt y Môr Offshore Wind Farm cables. Further investigation is therefore required with the Gwynt y Môr Offshore Wind Farm Offshore Transmission Owner (OFTO), in order to understand the extent of the constraint posed by the cables in this location.

Landfall 4 represents a route of a similar length if accessed from the west but is also constrained in the nearshore due to the presence of the Rhyl Flats Offshore Wind Farm cables, which rules out the option for a short HDD with a beach exit in this location.

Landfall 5 represents a longer route and requires a landfall HDD underneath a caravan park (as does landfall 4), however is not subject to any other environmental or engineering constraints.

All options have therefore been retained until further investigation, assessment and consultation has been undertaken as part of the refinement process, in order to further understand the extent of the constraints highlighted above.

Therefore, the following landfall options, with their refined onshore construction compound search zones, comprise the preferred options for the next stage of the refinement of options for the landfall:

- Landfall 3;
- Landfall 4; and
- Landfall 5.

These options are shown in Appendix Figure 3

## 5.3 Onshore Cable Corridor

### 5.3.1 Summary BRAG

Constraint information on each of the onshore cable corridors is shown below in Table 1. The information in the table was updated using Stakeholder feedback during the short list consultation. The information was used to assess which of the options should progress to the next stage of site selection consultation.

Topic	3b	3c	4b	4c	5a	5c
Onshore Ecology	Potential direct impacts to UK Habitats of Principle Importance (UKHPI) but which is likely to be mitigatable. Potential for impacts on a range of protected species. Nothing which, at this stage, would be unlikely to be mitigatable,	Potential direct impacts to UKHPI but which is likely to be mitigatable. Potential for impacts on a range of protected species. Nothing which, at this stage, would be unlikely to be mitigatable, although habitat	Potential direct impacts to UKHPI but which is likely to be mitigatable. Potential for impacts on a range of protected species. Nothing which, at this stage, would be unlikely to be mitigatable, although habitat	Crossing of Nant Meifod AW (without this crossing other constraints are Amber). Potential direct impacts to UKHPI but which is likely to be mitigatable. Potential for impacts on a range of protected species.	Potential indirect impacts to ancient woodland. Potential for impacts on a range of protected species. Nothing which, at this stage, would be unlikely to be mitigatable, although habitat creation would be required.	Potential direct impacts to UKHPI which cannot easily recover (e.g. semi-natural broadleaved woodland), and needs a discussion about feasibility of avoidance measures (i.e. HDD). Potential for impacts on an extensive range of

	although habitat creation would be required.	creation would be required.	creation would be required.	Nothing which, at this stage, would be unlikely to be mitigatable, although habitat creation would be required.		protected species. Nothing which, at this stage, would be unlikely to be mitigatable, although habitat creation would be required.
Onshore Water Resources	Potential direct impacts to surface watercourses can be managed and mitigated. Surface and fluvial flood risk can also be managed and mitigated. Crosses a larger number of watercourses than other options.	Potential direct impacts to surface watercourses can be managed and mitigated. Surface and fluvial flood risk can also be managed and mitigated. Eastern end of corridor is within 0.5km of reservoir, but impact pathways are unlikely.	Potential direct impacts to surface watercourses can be managed and mitigated. Surface and fluvial flood risk can also be managed and mitigated. Crosses a larger number of watercourses than other options.	Potential direct impacts to surface watercourses can be managed and mitigated. Surface and fluvial flood risk can also be managed and mitigated.	Potential direct impacts to surface watercourses can be managed and mitigated. Surface and fluvial flood risk can also be managed and mitigated. Passes within 0.5km of NVZs but mechanisms for significant impact are considered to be unlikely. Crosses a	Potential direct impacts to surface watercourses can be managed and mitigated. Surface and fluvial flood risk can also be managed and mitigated.

					larger number of watercourses than other options.	
Onshore Archaeology	Potential for archaeological remains to survive with mitigation options likely available. Moderate risk of temporary impacts associated with the setting of designated assets.	Potential for archaeological remains to survive with mitigation options likely available. Moderate risk of temporary impacts associated with the setting of designated assets.	Potential for archaeological remains to survive with mitigation options likely available. Moderate risk of temporary impacts associated with the setting of designated assets.	Potential for archaeological remains to survive with mitigation options likely available. Moderate risk of temporary impacts associated with the setting of designated assets.	Potential for archaeological remains to survive with mitigation options likely available. Moderate risk of temporary impacts associated with the setting of designated assets.	Ancient Woodland located within northern route option with options to micro-site. Potential for archaeological remains to survive with mitigation options likely available. Moderate risk of temporary impacts associated with the setting of designated assets.

<p>Traffic and Transport</p>	<p>The majority of the route away from the landfall location would have limited impacts upon sensitive receptors and could be accessed from roads with few network constraints.</p>	<p>The majority of the route away from the landfall location would have limited impacts upon sensitive receptors, however, construction traffic could be required to use some roads that are not suitable for high volumes of construction traffic.</p>	<p>The majority of the route away from the landfall location would have limited impacts upon sensitive receptors and could be accessed from roads with few network constraints.</p>	<p>The majority of the route away from the landfall location would have limited impacts upon sensitive receptors, however, construction traffic could be required to use some roads that are not suitable for high volumes of construction traffic.</p>	<p>The majority of the route away from the landfall location would have limited impacts upon sensitive receptors and could be accessed from roads with few network constraints.</p>	<p>Cable corridors 5c would require construction traffic to use some roads that are not suitable for high volumes of construction traffic. There would also be a significant impact upon communities associated with the northern and southern sections of the cable corridor.</p>
<p>Land Use</p>	<p>Onshore cable route crosses potential Elwy Solar Farm application (identified during ETG meeting) &amp; 1,700 dwelling application, which may</p>	<p>Consideration to avoid, mitigate or minimise impacts to PRow, long distance path and settlements. Majority of impacts will be</p>	<p>Onshore cable route crosses potential Elwy Solar Farm application (identified during ETG meeting) &amp; 1,700 dwelling application, which may</p>	<p>Consideration to avoid, mitigate or minimise impacts to PRow, long distance path and settlements. Majority of impacts will be</p>	<p>Onshore cable route crosses potential Elwy Solar Farm application (identified during ETG meeting) &amp; 1,700 dwelling application, which may</p>	<p>Consideration to avoid, mitigate or minimise impacts to PRow, long distance path and settlements. Majority of impacts will be</p>

	<p>constrain onshore cable route. Consideration to avoid, minimise or mitigate impacts to PRow's. Majority of impacts will be temporary and associated with construction activities</p>	<p>temporary and associated with construction activities</p>	<p>constrain onshore cable route. Consideration to avoid, minimise or mitigate impacts to PRow's. Majority of impacts will be temporary and associated with construction activities</p>	<p>temporary and associated with construction activities</p>	<p>constrain onshore cable route. Consideration to avoid, minimise or mitigate impacts to PRow's, long distance path and other community assets. Majority of impacts will be temporary and associated with construction activities</p>	<p>temporary and associated with construction activities</p>
<p>Noise and Vibration</p>	<p>Sporadic Noise Sensitive properties (NSP's) along route, some within 50m of the buffer centreline (North of route) Section of dense NSP's at</p>	<p>Sporadic NSP's along route, some within 50m of the buffer centreline (North of route) Section of dense NSP's at the north of</p>	<p>Sporadic NSP's along route, some within 50m of the buffer centreline (North of route) Section of dense NSP's at the north of</p>	<p>Sporadic NSP's along route, some within 50m of the buffer centreline (North of route) Section of dense NSP's at the north of</p>	<p>Sporadic NSP's along route, some within 50m of the buffer centreline Route also goes through a holiday park at the north of the route</p>	<p>Sporadic NSP's along route, some within 50m of the buffer centreline Section of dense NSP's at the north of the route (near the landfall)</p>

	the north of the route (near the landfall)	the route (near the landfall)	the route (near the landfall)	the route (near the landfall)		
Landscape and Visual	Land not within designated landscape, but near some visual receptors and located within landscape capable of accommodating development to some degree. Short term, temporary construction effects limits duration and nature of impacts on all landscape character and visual receptors providing that permanent	Land not within designated landscape, but near some visual receptors and located within landscape capable of accommodating development to some degree. Short term, temporary construction effects limits duration and nature of impacts on all landscape character and visual receptors providing that permanent	Land not within designated landscape, but near some visual receptors and located within landscape capable of accommodating development to some degree. Short term, temporary construction effects limits duration and nature of impacts on all landscape character and visual receptors providing that permanent	Land not within designated landscape, but near some visual receptors and located within landscape capable of accommodating development to some degree. Short term, temporary construction effects limits duration and nature of impacts on all landscape character and visual receptors providing that permanent	Land not within designated landscape, but near some visual receptors and located within landscape capable of accommodating development to some degree. Short term, temporary construction effects limits duration and nature of impacts on all landscape character and visual receptors providing that permanent	Land not within designated landscape, but near some visual receptors and located within landscape capable of accommodating development to some degree but close to Clwydian Range and Dee Valley AONB. Short term, temporary construction effects limits duration and nature of impacts on all landscape

	effects on landscape features such as woodland and mature trees are avoided/limited through best practice techniques.	effects on landscape features such as woodland and mature trees are avoided/limited through best practice techniques.	effects on landscape features such as woodland and mature trees are avoided/limited through best practice techniques.	effects on landscape features such as woodland and mature trees are avoided/limited through best practice techniques.	effects on landscape features such as woodland and mature trees are avoided/limited through best practice techniques.	character and visual receptors providing that permanent effects on landscape features such as woodland and mature trees are avoided/limited through best practice techniques.
Tourism and Socio Economics	Consideration required to avoid, minimise or mitigate impacts to PRowS and accommodation at coast	Consideration required to minimise, avoid or mitigate impacts to tourist accommodation at coast, and crossing PRowS	Consideration required to avoid, minimise or mitigate impacts to PRowS and accommodation at coast	Consideration required to minimise, avoid or mitigate impacts to tourist accommodation at coast, and crossing PRowS	Consideration required to minimise, avoid or mitigate impacts to tourist accommodation at coast, and crossing PRowS	Consideration required to minimise, avoid or mitigate impacts to tourist accommodation at coast, and crossing PRowS
Engineering	Underlying geology and flood zones present acceptable	Underlying geology, topography and flood zones present acceptable	Underlying geology and flood zones present acceptable	Underlying geology, topography and flood zones present acceptable	Underlying geology and flood zones present risks to this option. High Risk	Underlying geology, topography and flood zones present risks to this

	risks to this option.	complex crossings identified.	option. High Risk complex crossings identified.  Utilities pose constraint along route.			
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Table 1. Onshore cable Corridor summary BRAG

## 5.3.2 Conclusion

Option 5c has not been taken forward due to carrying more engineering and environmental constraints than any other option, including significant engineering risks associated with the River Elwy HDD, and Option 5a being a more favourable option in comparison.

Key outstanding challenges remain in relation to the viability of crossing the proposed Elwy Solar Energy Farm and A55 via options 3b/4b and 5a. As options routing through this area are otherwise preferable from an environmental, engineering and cost perspective, until these risks have been further investigated, the remaining options have been retained. Therefore, the following three options comprise the preferred options for the next stage of the site selection process for the onshore cable corridor:

- Option 3b/4b;
- Option 3c/4c; and
- Option 5a.

These options are shown in Appendix Figure 8.

## 5.4 Onshore Substation

### 5.4.1 Summary BRAG

Constraint information on each of the onshore substation zones is shown below in Table 2. The information in the table was updated using Stakeholder feedback during the short list consultation. The information was used to assess which of the options should progress to the next stage of site selection consultation.

Topic	Onshore substation zone 1	Onshore substation zone 5	Onshore substation zone 10	Onshore substation zone 11	Onshore substation zone 13	Onshore substation zone 14	
Onshore Ecology	Potential for indirect effects on nationally designated sites; and for direct effects on as yet unidentified local sites. Potential for impacts on a range of protected species. Nothing which,	Potential for indirect effects on nationally designated sites; and for direct effects on as yet unidentified local sites. Potential for impacts on a range of protected species. Nothing which,	Potential for indirect effects on nationally designated sites; and for direct effects on as yet unidentified local sites. Potential for impacts on a range of protected species. Nothing which,	Potential for indirect effects on nationally designated sites; and for direct effects on as yet unidentified local sites. Potential for impacts on a range of protected species. Nothing which,	Potential for indirect effects on nationally designated sites; and for direct effects on as yet unidentified local sites. Potential for impacts on a range of protected species. Nothing which,	Potential for indirect effects on nationally designated sites; and for direct effects on as yet unidentified local sites. Potential for impacts on a range of protected species. Nothing which,	Potential for indirect effects on nationally designated sites; and for direct effects on as yet unidentified local sites. Potential for impacts on a range of protected species. Nothing which,

	at this stage, would be unlikely to be mitigatable, although habitat creation would be required.	at this stage, would be unlikely to be mitigatable, although habitat creation would be required.	at this stage, would be unlikely to be mitigatable, although habitat creation would be required.	at this stage, would be unlikely to be mitigatable, although habitat creation would be required.	at this stage, would be unlikely to be mitigatable, although habitat creation would be required.	at this stage, would be unlikely to be mitigatable, although habitat creation would be required.
Onshore Water Resources	No significant constraints associated with onshore water and sediment quality	No significant constraints associated with onshore water and sediment quality. Surface water flood risk can be managed and mitigated	No significant constraints associated with onshore water and sediment quality. Surface water flood risk can be managed and mitigated	No significant constraints associated with onshore water and sediment quality	No significant constraints associated with onshore water and sediment quality. Surface water flood risk can be managed and mitigated	No significant constraints associated with onshore water and sediment quality. Surface water flood risk can be managed and mitigated
Onshore Archaeology	Potential for archaeological remains to survive with mitigation options likely available. Moderate to	High potential for impacts associated with the setting of designated assets and historic	High potential for impacts associated with the setting of designated assets and historic landscape	Moderate risk of impacts associated with the setting of designated assets.	Moderate risk of impacts associated with the setting of designated assets.	Moderate risk of impacts associated with the setting of designated assets.

	<p>high risk of impacts associated with the setting of designated assets.</p>	<p>landscape character.</p>	<p>character. Potential for archaeological remains to survive with mitigation options likely available.</p>			
<p>Traffic and Transport</p>	<p>There would be no significant constraints associated with the Substation 1 site.</p>	<p>There would be no significant constraints associated with the Substation 5 site.</p>	<p>Access via the local unnamed road that runs west of the Substation 10 site would not be possible as the road is not wide enough for two vehicles and it would not be possible to widen without extensive work and land acquisition. The Substation</p>	<p>Access via the local unnamed road that runs west of the Substation 11 site would not be possible as the road is not wide enough for two vehicles and it would not be possible to widen without extensive work and land acquisition. The Substation</p>	<p>There are significant engineering and road safety constraints upon access, and construction traffic would also impact upon at St. Asaph.</p>	<p>There are significant engineering and road safety constraints upon access, and construction traffic would also impact upon at St. Asaph.</p>

			10 site should be discounted unless a new access (approx. 1km) can be constructed from the B5381. If a new access can be constructed the BRAG score could be reduced to green.	11 site should be discounted unless a new access (approx. 0.9km) can be constructed from the B5381. If a new access can be constructed the BRAG score could be reduced to green.		
Land Use	Consideration to avoid, mitigate or minimise impacts to PRow and impacts to campus and business park. Consideration to avoid	Consideration to avoid, mitigate or minimise impacts to campus and business park. Consideration to avoid residential property.	Consideration to avoid residential property.	Consideration to avoid residential property.	Consideration to avoid residential property.	Consideration to avoid residential property.

	residential property.					
<b>Noise and Vibration</b>	Closest identified noise sensitive receptor between 100m and 200m from substation footprint boundary	Closest identified noise sensitive receptors are greater than 250m from closest point of footprint boundary	Closest identified noise sensitive receptor 200m from substation footprint boundary	Noise sensitive site approximately 200-300m from operational footprint boundary	Closest identified noise sensitive receptor between 100m and 200m from footprint boundary	Noise sensitive site approximately 200-300m from operational footprint boundary
<b>Landscape and Visual</b>	Significant visual and potential residential amenity effects on residential receptors and community facility/businesses, which could be mitigated with offsite planting closer to properties.	Some interaction for visual receptors and valued local landscapes, but capacity to accommodate development exists. Potential to mitigate visibility due to available	Visual effects on nearby properties at close proximity. There is potential for some mitigation but this will take time to take effect. Cumulative effects with other sub-	Some interaction for visual receptors and valued local landscapes, but capacity to accommodate development exists. Possible issue with views from and	Some interaction for visual receptors and valued local landscapes, but capacity to accommodate development exists.	Some interaction for visual receptors and valued local landscapes, but capacity to accommodate development exists. Potential to mitigate visibility due to available

		space for planting and earthworks.	stations and pylon routes ensure a degree of clustering, however it is not adjacent so combined visibility by receptors is also cumulatively detrimental.	association with St Asaph.		space for planting and earthworks. However, there is the possibility that the substation may be visible from higher ground locations to the east due to their elevation and lower lying woodland. At this stage in the process it is difficult to tell. If this is the case its position on the edge of what would appear as a slightly upland location
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						above the valley may seem incongruous. This should be checked before proceeding with this site.
Tourism and Socio Economics	Consideration of mitigation required for impacting PRow	Impacts of a substation would be long term through construction / operation and would require screening / other mitigation to minimise impacts.	No risks from current data			

<p>Engineering</p>	<p>Site gradient and underlying geology constraints present risks for this option.</p> <p>Constraints regarding drainage connection identified but elevation difference means not a significant issue.</p> <p>Multiple utilities diversions required.</p>	<p>Site gradient and underlying geology constraints present risks for this option.</p> <p>Diversion of water main required.</p> <p>Connection to utilities to supply substation present a risk for this option.</p>	<p>Site gradient, underlying geology, potential mining and appropriate vehicular access constraints present risks for this option.</p>	<p>Site gradient, appropriate vehicular access and drainage connection constraints present risks for this option.</p> <p>One complex (likely requiring HDD) crossing identified on route connecting to NG Substation.</p> <p>Diversion of gas main and overhead electricity line required.</p>	<p>Appropriate vehicular access and drainage connection constraints present risks for this option.</p> <p>One complex (likely requiring HDD) crossing identified on route connecting to NG Substation</p> <p>Diversion of overhead electricity line required.</p> <p>Connection to utilities to supply substation</p>	<p>Site gradient constraints present risks for this option.</p> <p>Appropriate vehicular access and drainage connection constraints present major risks for this option.</p> <p>Two complex (likely requiring HDD) crossings identified on route connecting to NG Substation</p> <p>Diversion of overhead electricity lines and gas main</p>
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						present a risk for this option.	required. Connection to utilities to supply substation present a risk for this option.
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Table 2. Onshore substation summary BRAG

## 5.4.2 Conclusion

Zone 1 has not been taken forward primarily due to the potential impact on nearby residential receptors in terms of visual amenity, and critically the likelihood that mitigation would not be achievable given the local topography constraints.

Zones 13 and 14 have not been taken forward primarily due to the access constraints for making these options achievable. Creating new access routes from existing highways to these two zones presents a significant health and safety concern and therefore these options have been deselected.

The remaining options are all considered potentially viable options for the onshore substation and therefore all of these options are being retained for the next stage of site selection consultation. The preferred options present fewer environmental and engineering constraints. The following three options comprise the preferred options for the next stage of refinement process for the onshore substation site:

- Zone 5;
- Zone 10; and
- Zone 11.

These options are shown in Appendix Figure 9 (with indicative footprint and compound size shown for information only).

## 6. Conclusion

The feedback gained from Stakeholders through the short list consultation was used to refine and select preferred options for each of the elements of the transmission network.

The following options have been identified through the site selection process as the preferred options for the next stage of the EIA process:

Offshore cable corridor	Landfall	Onshore cable corridor	Onshore substation zone
West C	Landfall 3	Option 3b/4b	Option 5d
East A (i)	Landfall 4	Option 3c/4c	Option 10
East B (N) / East B (S)	Landfall 5	Option 5a	Option 11

These options are shown in Appendix Figures 3, 7, 8, and 9.

A brief overview of the preferred options and a summary of the BRAG is shown below.

Corridor Option	Corridor Option	Summary BRAG
East A(i)	The East A(i) corridor follows the same orientation as the East-West interconnector and upon crossing the Gwynt y Môr export cables runs in a southerly direction parallel to the Gwynt y Môr cables. This corridor also crosses the East-West interconnector and crosses an aquaculture area before the corridor swathe meets the shore at Landfall Option 4.	<ul style="list-style-type: none"> <li>Corridor developed after aquaculture area was found to be redundant.</li> <li>Has potential for nearshore cable protection which presents a higher risk for navigation and shipping.</li> <li>Requires crossings of both sets of Gwynt y Môr cables and East-West interconnector.</li> <li>Low risks for chartered wrecks.</li> </ul>
East B	The East B corridor overlaps the East A corridor until it crosses the East-West interconnector to the west of the North Hoyle offshore wind farm export cables. Thereafter, it diverts in a south easterly direction, crossing the North Hoyle export cables and meets the shore at Landfall Option 5.	<ul style="list-style-type: none"> <li>Has potential for nearshore cable protection which presents a higher risk for navigation and shipping.</li> <li>Crosses North Hoyle Cables.</li> <li>Low risk for commercial fisheries, benthic and no chartered wrecks within corridor.</li> </ul>
West C	The West C corridor has a wide swathe funnelling out from the southern tip of the wind farm AfL. It crosses a large sandbank as it follows a south-south east direction. It abuts a shellfish water area before reaching the shore at Landfall Option 3.	<ul style="list-style-type: none"> <li>Crosses Annex 1 sandbank and located within the Liverpool Bay SPA so scores medium risk for ornithology and benthic ecology interactions.</li> <li>Two chartered wrecks within corridor but still scores low as can be microsited around</li> <li>Minor interaction with shellfish waters.</li> </ul>

Table 3. Offshore Corridors Summary BRAG of Preferred Options.

Cable Corridor Option	General Description	Summary BRAG
3b / 4b	<p>Making landfall at option 3 at Pensarn Beach, heading in a south easterly direction, passing key areas of Belgrano and Pensarn to the east and west, before heading east, south of Towyn, then south easterly direction entering the substation AoS from the north side near Pengwern, slightly further east than Option 4b.</p> <p>Making landfall at option 4 at Ty Gwyn Caravan park, heading in a southerly direction, passing key areas of Belgrano before heading in a easterly direction south of Towyn, then south, entering the substation AoS from the north, northwest of Bodelwyddan, slightly further west than Option 3b.</p>	<ul style="list-style-type: none"> <li>• Higher risk of interactions with environmental constraints due to ancient woodland and land use.</li> <li>• Medium impacts on archaeology, water and sediment quality, tourism and socioeconomic impacts.</li> <li>• Low impact on traffic and transport.</li> <li>• Higher risk for engineering due to the potential for soft geology in selected areas which are likely to be mitigatable.</li> </ul>
3c / 4c	Making landfall at option 3, this cable corridor heads south, and to the west of Kinmel Park, before making a right turn east toward the substation AoS.	<ul style="list-style-type: none"> <li>• Medium impact on environmental constraints such as archaeology, ecology, land use, water and sediment quality, tourism and socioeconomics.</li> <li>• Low impact on traffic and transport.</li> <li>• Higher risk for ground conditions in the engineering BRAG.</li> </ul>
5a	Making landfall at option 5 at Rhyl Golf Course, heading in a southerly direction between key areas of Prestatyn and Rhyl to the east and west, before heading in a south westerly direction between Rhyl and Rhuddlan, entering the substation AoS from a north easterly direction near Pengwern, slightly further east than Option 3b.	<ul style="list-style-type: none"> <li>• Medium environmental impacts on archaeology, ecology, land use, water and sediment quality, tourism, socioeconomics, traffic and transport.</li> <li>• Higher risk for engineering constraints such as ground conditions and the number of more complex crossings required.</li> </ul>

Table 4. Onshore Corridors Summary BRAG of Preferred Options

Option	Location	Summary BRAG
5	Located between Bodelwyddan Park and New Vision Business Park, situated between the A55 and the B5381. Zone 5 is limited by ancient woodland to the north and west, roads to the south and the great crested newt compensation area to the east.	<ul style="list-style-type: none"> <li>• Scores low on LVIA assessment. Potential to mitigate visibility with space for planting or earthworks.</li> <li>• Higher potential for impacts on archaeology.</li> <li>• Medium impact on ecology and tourism constraints.</li> <li>• Low impact on traffic and transport and water quality.</li> <li>• Medium risk for engineering constraints.</li> </ul>
10b	Located in the more central area of the AoS, current Bodelwyddan National Grid and existing Gwynt y Môr substations to the north, along with associated overhead lines. Zone 10 is limited by overhead lines to the north, and changes in gradient and properties to the south.	<ul style="list-style-type: none"> <li>• Higher impact on LVIA due to potential impacts on nearby properties.</li> <li>• High impact on traffic and archaeology, although mitigation available.</li> <li>• Medium impact on ecology and low impact on land use, tourism and socioeconomics constraints.</li> <li>• Medium risk for engineering constraints.</li> </ul>

11b	<p>Located in the East Corner of the AoS, near to Penrhewl.</p> <p>Zone 11 is limited by overhead lines and roads to the north, south and west, and ancient woodland to the east.</p>	<ul style="list-style-type: none"> <li>• Low impact for LVIA, land use, tourism and socioeconomics.</li> <li>• Medium impact for archaeology.</li> <li>• Higher impact on traffic and transport.</li> <li>• Medium-high risk for engineering constraints.</li> </ul>
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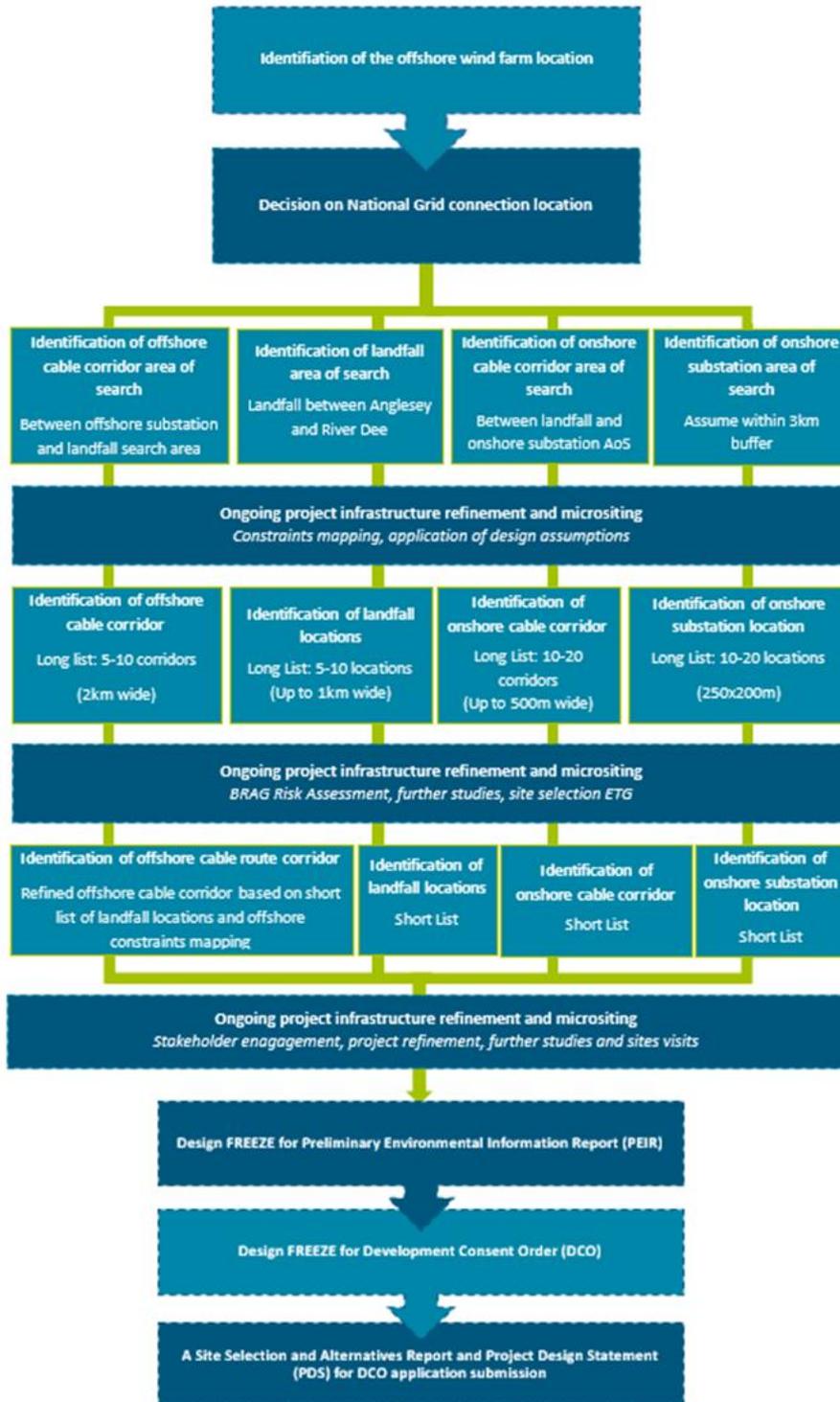
Table 5. Onshore Substation Summary BRAG of Preferred Options

The preferred options will be taken forward to the next round of consultation which will take the form of virtual public engagement sessions in Q4 2020 and further Expert Topic Groups in Q1 2021. This consultation will help inform the choice of one single preferred option to be carried forward into the Preliminary Environmental Information Report which is due to be submitted to PINS Q2 2021.

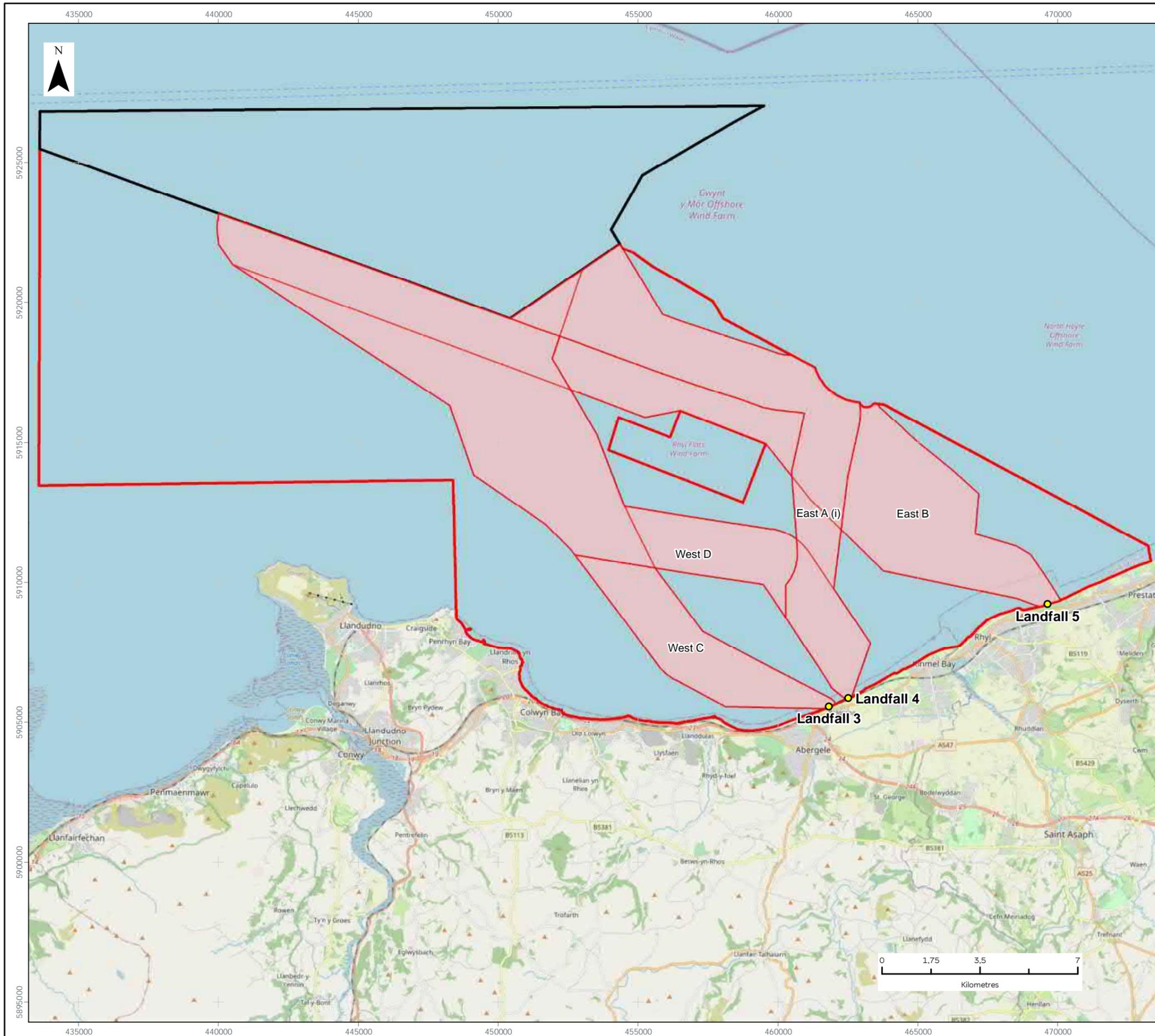
### Next Steps

Over the course of the next few months, engagement activity on the preferred options will commence. Views on the preferred options will be sought from the public as part of the project's first informal round of stakeholder engagement and again from key stakeholders through the ETG process. The information gathered from these interactions and early results from environmental surveys will help define the single option to be taken forward to statutory consultation.

The following diagram sets out the site selection process that has been undertaken to date and the next steps.



## 7. Appendices



**LEGEND**

- Awel Y Môr AfL
- Potential Offshore Cable Corridor (2km)
- Offshore Cable Corridor Area of Search
- Indicative Landfall Location

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PROJECT TITLE:  
***AWEL Y MOR OFFSHORE WINDFARM***

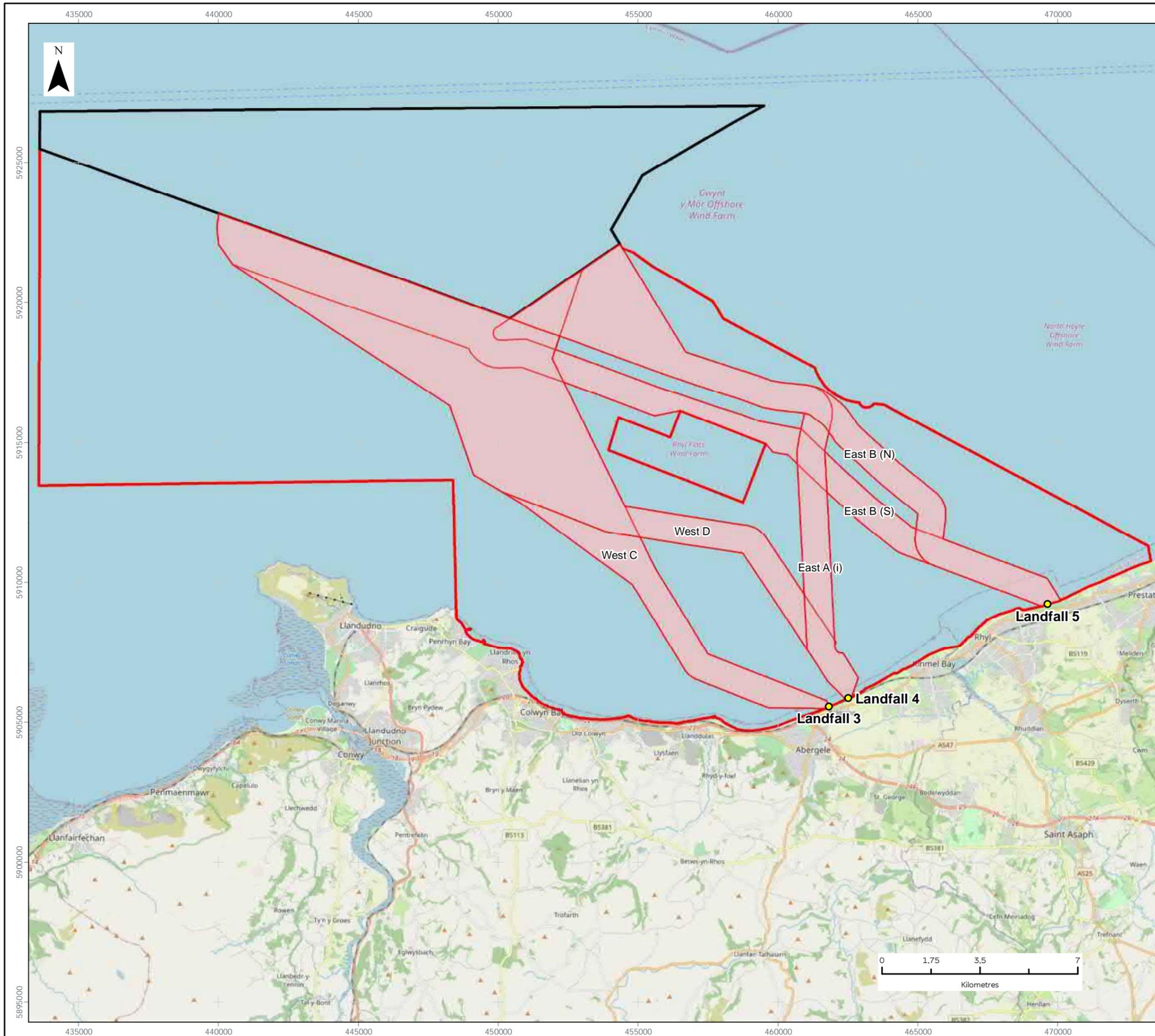
DRAWING TITLE:  
**Figure 1:  
 Short List of Offshore Cable Corridor Options**

VER	DATE	REMARKS	Drawn	Checked
01	01/09/2020	For Issue	ui918773	K. Algate

DRAWING NUMBER:  
**003705786-01**

SCALE: <b>1:140,000</b>	PLOT SIZE: A3	DATUM: WGS 1984	PROJECTION: UTM Zone 30N
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**LEGEND**

-  Awel Y Môr AFL
-  Potential Offshore Cable Corridor
-  Offshore Cable Corridor Area of Search
-  Indicative Landfall Location

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PROJECT TITLE:  
***AWEL Y MÔR OFFSHORE WINDFARM***

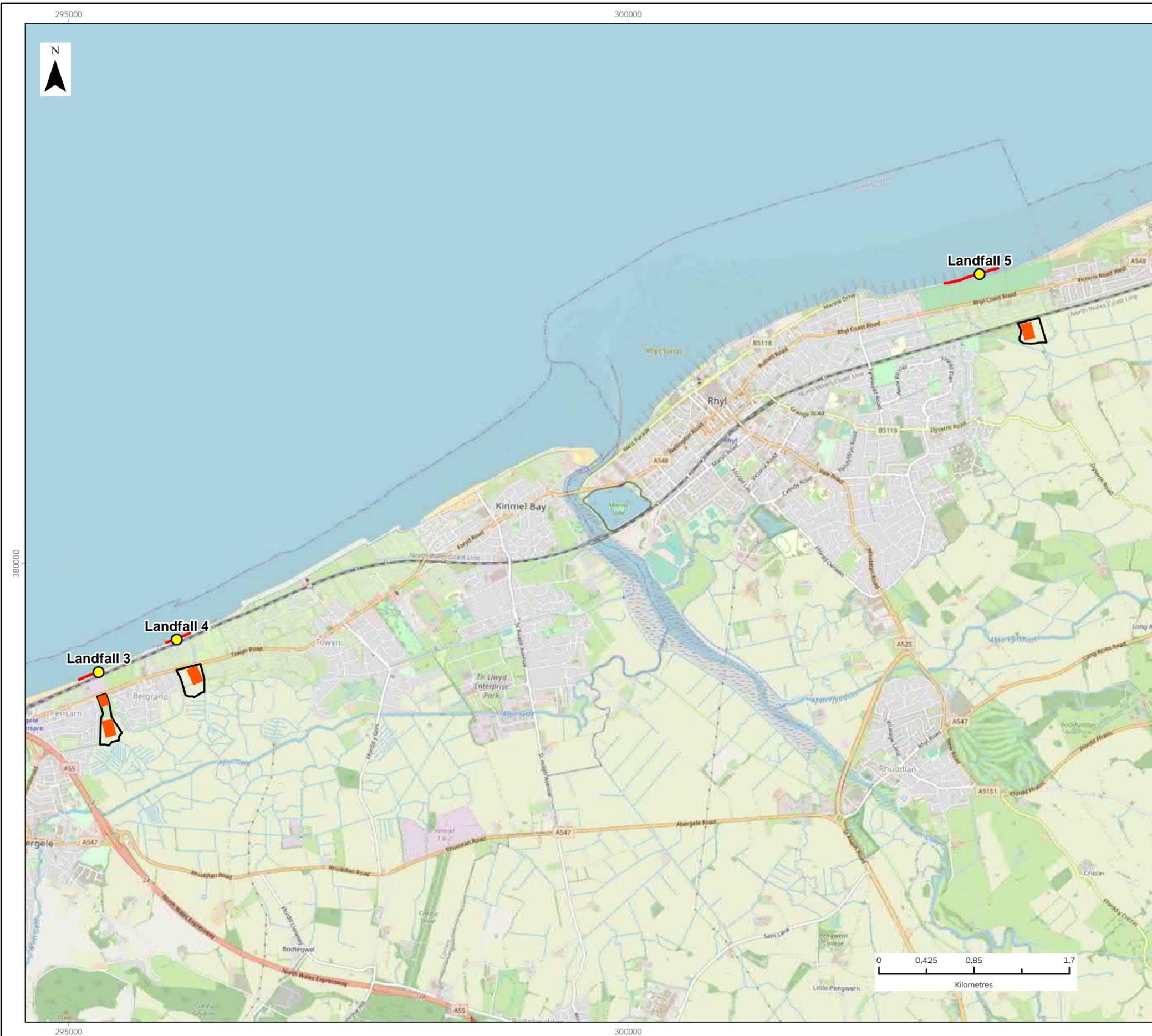
DRAWING TITLE:  
**Figure 2:  
 Refined Short List of Offshore Cable Corridor Options**

VER	DATE	REMARKS	Drawn	Checked
01	01/09/2020	For Issue	ui918773	K. Algate

DRAWING NUMBER:  
**003705787-01**

SCALE: <b>1:140,000</b>	PLOT SIZE: A3	DATUM: WGS 1984	PROJECTION: UTM Zone 30N
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**LEGEND**

- Indicative Landfall Location
- Landfall Zone
- Potential Compound Zone
- Indicative Compound Location

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PROJECT TITLE:  
***AWEL Y MOR OFFSHORE WINDFARM***

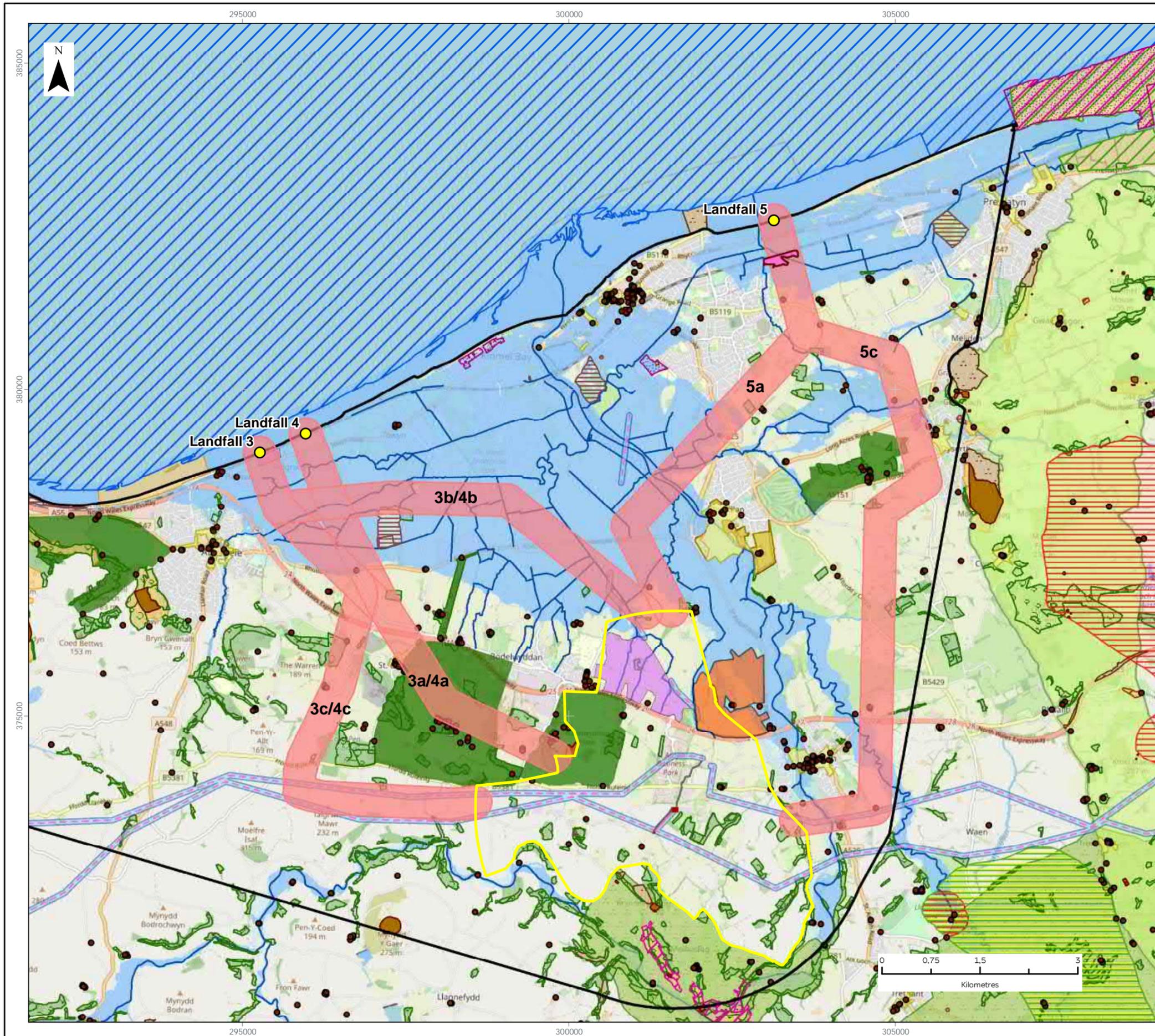
DRAWING TITLE:  
**Figure 3:  
 Short List of Landfall Options**

VER	DATE	REMARKS	Drawn	Checked
01	01/09/2020	For Issue	ui918773	K. Algate

DRAWING NUMBER:  
**003705789-01**

SCALE: <b>1:35,000</b>	PLOT SIZE: A3	DATUM: OSGB1936	PROJECTION: British National Grid
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**LEGEND**

- Onshore Cable Corridor Area of Search
- Potential Onshore Cable Corridor (500m width)
- Indicative Landfall Location
- Onshore Substation Area of Search
- National Grid Substation Sites
- Area of Outstanding Natural Beauty (AONB)
- Ancient Woodland
- Ramsar
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Sites of Special Scientific Interest (SSSI)
- Local Nature Reserve (LNR)
- Maes Gwylim Nature Reserve
- Listed Building
- Conservation Area
- Scheduled Monument
- Historic Landscape
- Registered Historic Parks & Gardens
- Main River
- Flood Zone 3
- Flood Zone 2
- Geological Conservation Review (GCR) Site
- Regionally Important Geological & Geomorphological Site (RIG)
- High Voltage Underground Electricity Cable
- Electricity Transmission Overhead Lines
- Overhead Line 40m Buffer
- Historic Landfill Site
- Planning Permission
- Elwy Solar Energy Farm
- Source Protection Zone
- Source protection zone I
- Source protection zone II
- Source protection zone III

Data Source: Natural Resources Wales, 2020; Welsh Government, 2020; Historic Environment Service (Cadw), 2020; National Grid UK, 2020; © Royal HaskoningDHV 2020. Contains Ordnance Survey data © Crown copyright and database rights 2020. World Imagery: © OpenStreetMap (and) contributors, CC-BY-SA

PROJECT TITLE:  
*AWEL Y MOR OFFSHORE WINDFARM*

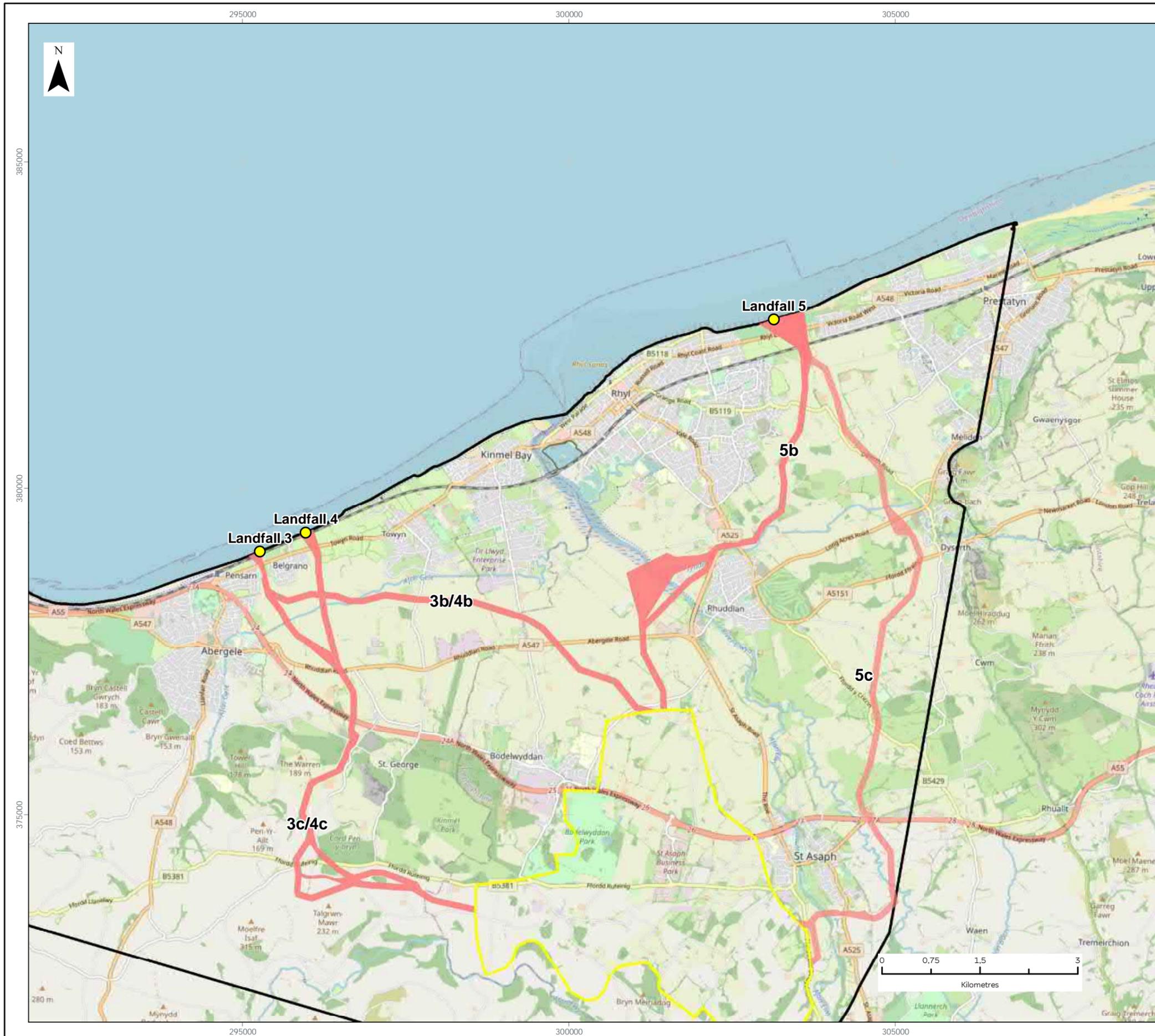
DRAWING TITLE:  
**Figure 4:  
Onshore Cable Corridor Short List of Options**

VER	DATE	REMARKS	Drawn	Checked
01	01/09/2020	For Issue	ui918773	K. Algate

DRAWING NUMBER:  
**003705790-01**

SCALE	PLOT SIZE	DATUM	PROJECTION
1:60,000	A3	OSGB1936	British National Grid





**LEGEND**

- Onshore Cable Corridor Area of Search
- Potential Onshore Cable Corridor
- Onshore Substation Area of Search
- Indicative Landfall Location

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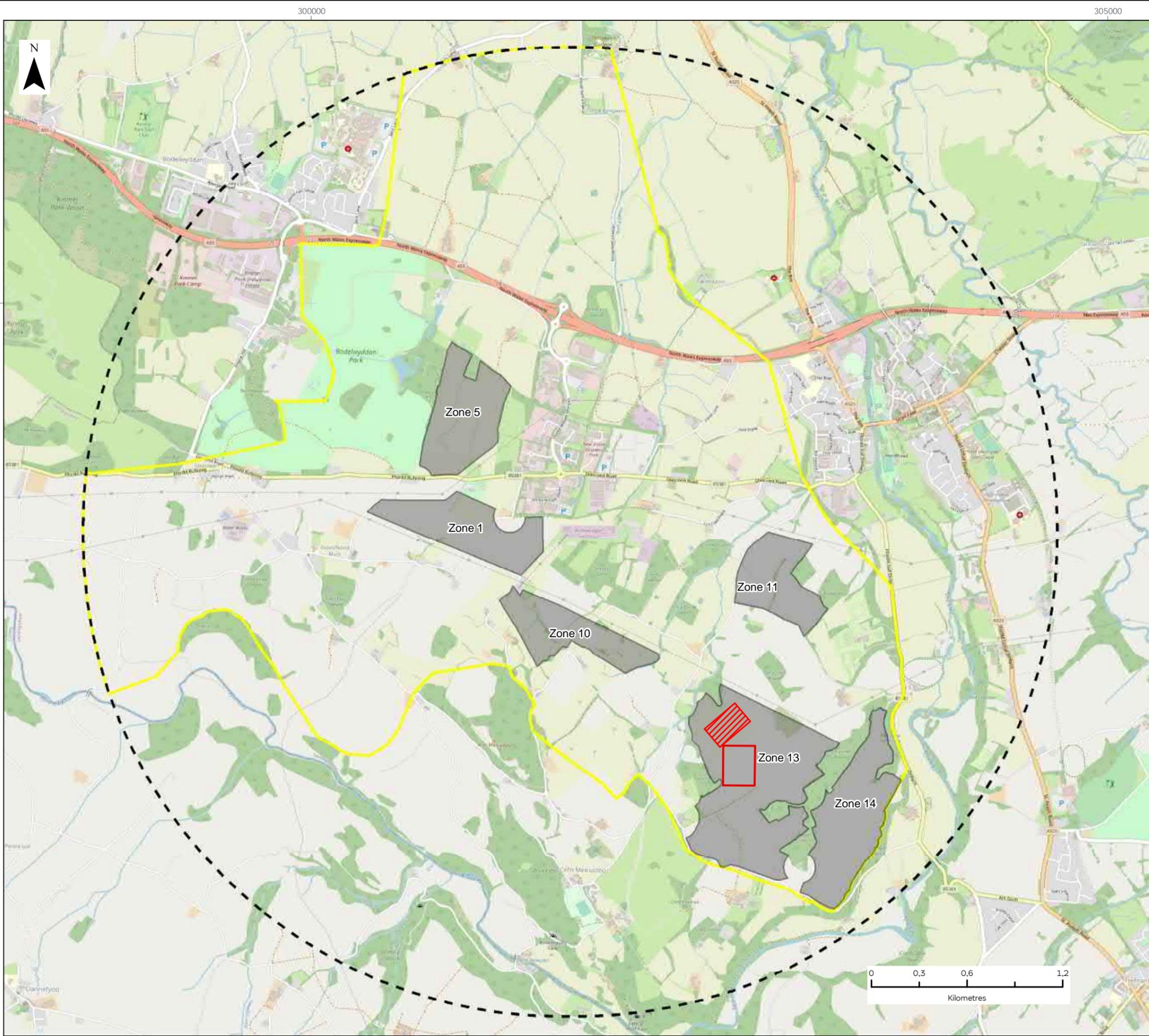
DRAWING TITLE:  
**Figure 5:  
 Onshore Cable Corridor Refined Shortlist**

VER	DATE	REMARKS	Drawn	Checked
01	01/09/2020	For Issue	ui918773	K. Algate

DRAWING NUMBER:  
**003705791-01**

SCALE: <b>1:60.000</b>	PLOT SIZE: A3	DATUM: OSGB1936	PROJECTION: British National Grid
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- LEGEND**
- 3km Refined Substation Search Area
  - Onshore Substation Area of Search
  - Onshore Substation Zones
  - Example Project Operational Compound footprint
  - Example Project Construction Compound footprint

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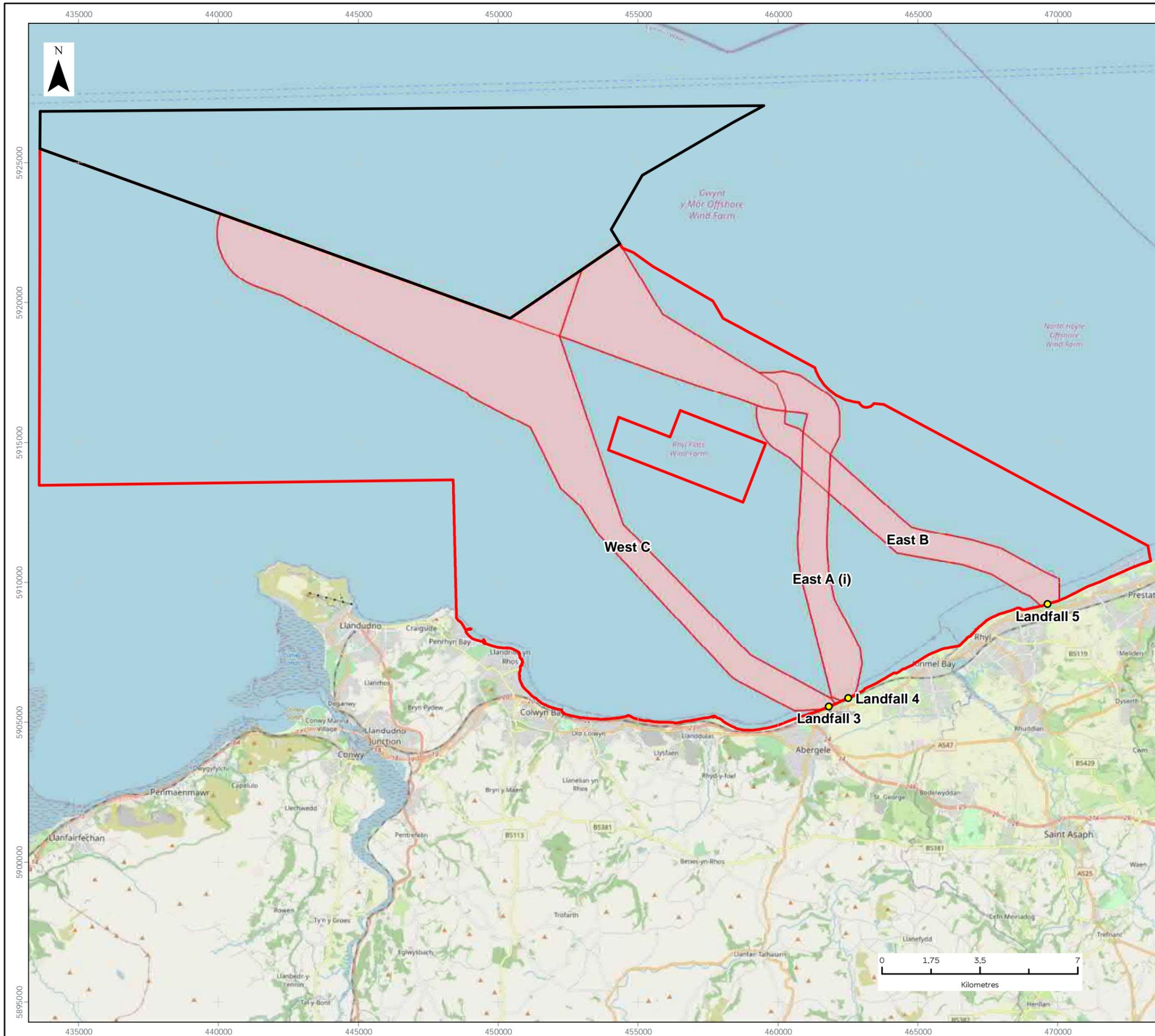
DRAWING TITLE:  
**Figure 6:  
 Short List of Onshore Substation Options**

VER	DATE	REMARKS	Drawn	Checked
01	01/09/2020	For Issue	ui918773	K. Algate

DRAWING NUMBER:  
**003705792-01**

SCALE: <b>1:25,000</b>	PLOT SIZE: A3	DATUM: OSGB1936	PROJECTION: British National Grid
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**LEGEND**

- Awel Y Môr AfL
- Offshore Cable Corridor Area of Search
- RWE preferred Offshore Cable Corridors
- Indicative Landfall Location

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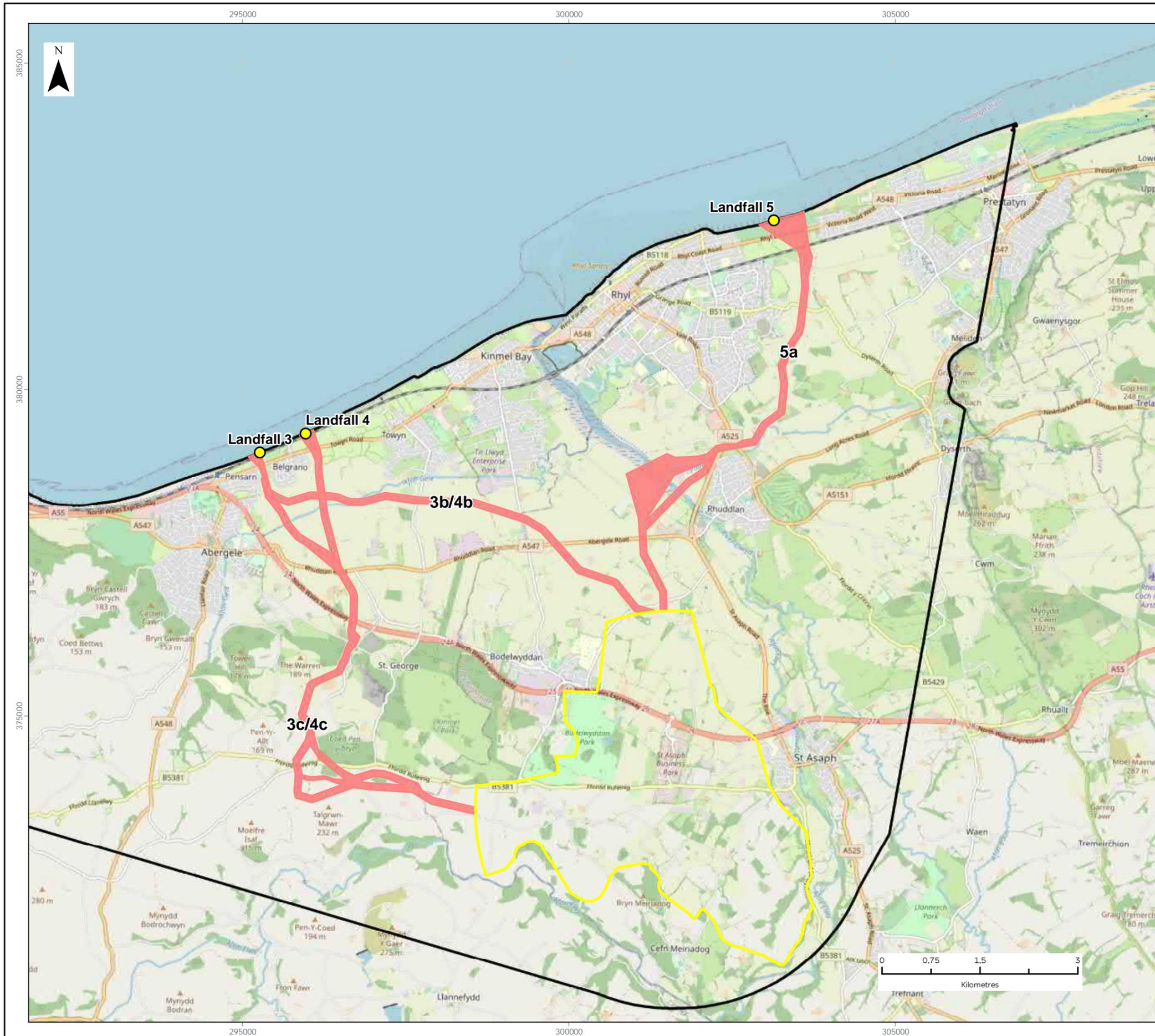
DRAWING TITLE:  
**Figure 7:  
 Offshore Cable Corridor Preferred Options**

VER	DATE	REMARKS	Drawn	Checked
01	01/09/2020	For Issue	ui918773	K. Algate

DRAWING NUMBER:  
**003705793-01**

SCALE: <b>1:140,000</b>	PLOT SIZE: A3	DATUM: WGS 1984	PROJECTION: UTM Zone 30N
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**LEGEND**

- Onshore Cable Corridor Area of Search
- Potential Onshore Cable Corridor
- Indicative Landfall Location
- Onshore Substation Area of Search

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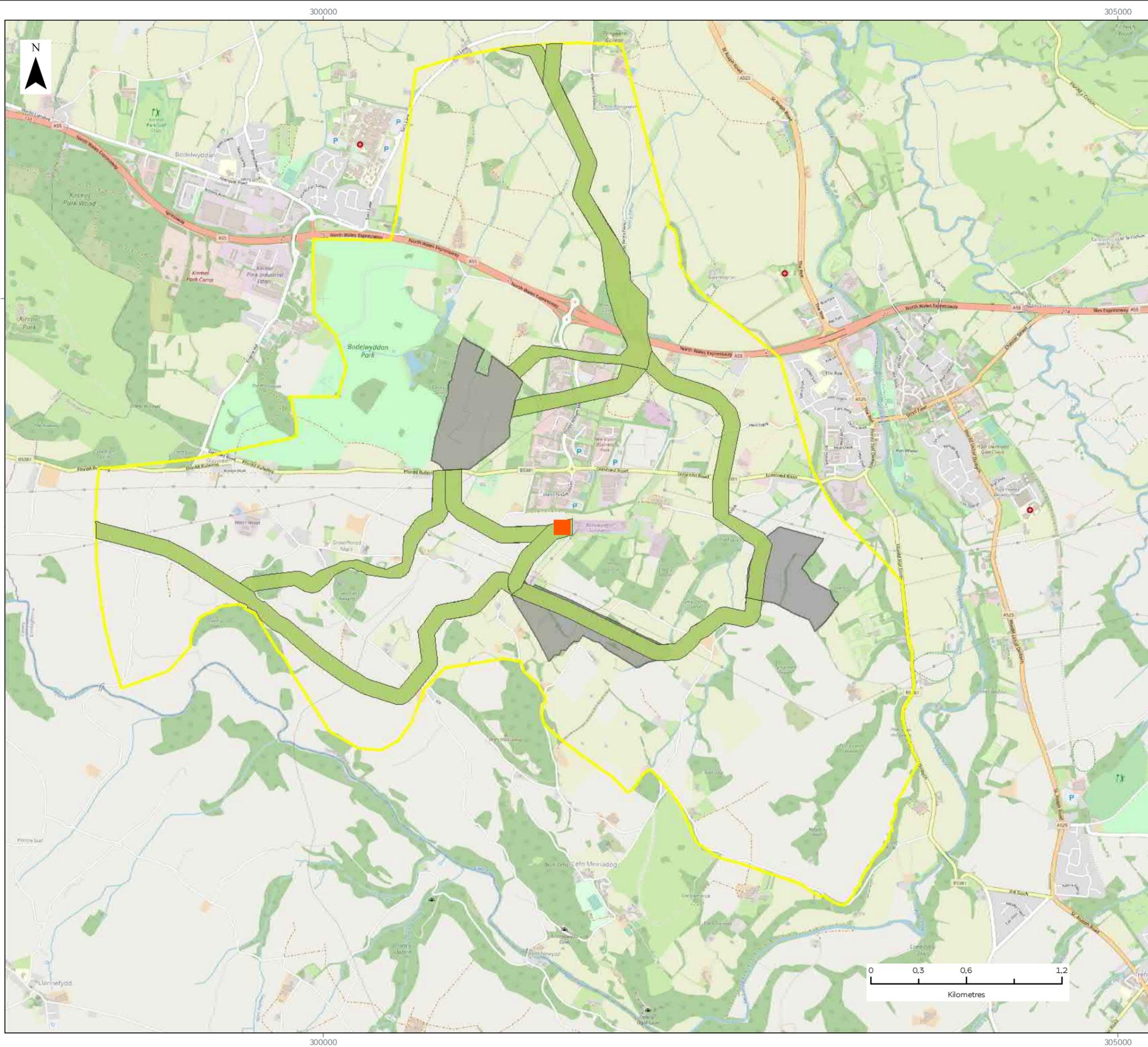
DRAWING TITLE:  
**Figure 8:  
 Onshore Cable Corridor Preferred Options**

VER	DATE	REMARKS	Drawn	Checked
01	01/09/2020	For Issue	ui918773	K. Algate

DRAWING NUMBER:  
**003705795-01**

SCALE: <b>1:60,000</b>	PLOT SIZE: A3	DATUM: OSGB1936	PROJECTION: British National Grid
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**LEGEND**

- Onshore Substation Area of Search
- Onshore Substation Zones
- Substation Cable Corridor (100m)
- Proposed National Grid Substation Footprint

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PROJECT TITLE:  
***AWEL Y MOR OFFSHORE WINDFARM***

DRAWING TITLE:  
**Figure 9:  
 Onshore Substation Preferred Option(s)**

VER	DATE	REMARKS	Drawn	Checked
01	01/09/2020	For Issue	RE57046	K. Algate

DRAWING NUMBER:  
**003705798-02**

SCALE: <b>1:25,000</b>	PLOT SIZE: A3	DATUM: OSGB1936	PROJECTION: British National Grid
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Awel y Môr Offshore Wind Farm Ltd.  
[www.awelymor.cymru](http://www.awelymor.cymru)

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