



**Kildare-Meath Grid Upgrade**  
**Step 4A Report - Analysis of the Route Options**

KMGU-JAC-TN-0017

March 2022

**EirGrid**



## Kildare-Meath Grid Upgrade

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## Glossary and Abbreviations

Abbreviations	
ACA	Architectural Conservation Areas
AAP	Areas of Archaeological Potential
AEOS	Agri Environmental Options Scheme
AIS	Air insulated
ASI	Archaeological Survey of Ireland
CAFE	Cleaner Air for Europe
CFRAM	Catchment Flood Risk Assessment and Management
CPD	County Development Plan
CSO	Central Statistics Office
EHV	Extra High Voltage
End-to-End	A cable option that runs from Woodland to Dunstown substation. Made up of smaller route sections added together.
EPA	Environmental Protection Agency
GIS	Geographic Information System
GSI	Geological Survey Ireland
HDD	Horizontal Directional Drilling
IGHS	Irish Geological Heritage Sites
i-WeBS	Irish Wetland Bird Survey
LCA	Landscape Character Area
MVAr	Mega Volt Amps (reactive)
MCA	Multi-Criteria Analysis
Node	A point where two or more route sections meet – labelled alphabetically.
NIAH	National Inventory of Architectural Heritage
NHA/ pNHA	Natural Heritage Area/ Proposed Natural Heritage Area
NPWS	National Parks and Wildlife Services
OHL	Overhead Line
OPW	Office of Public Works
PWS	Public Water Supply
Route section	A potential route of cable that has been assessed as an option. Not a full length from Woodland to Dunstown substation but a small length in between. Several can be added together to make an End-to-End option.
RHM	Register of Historic Monuments
RMP	Record of Monuments and Places
RPS	Records of Protected Structures
RBMP	River Basin Management Plan
SAC	Special Area of Conservation, designated under the EU Habitats Directive
SI	Statutory Instrument
SMR	Sites and Monuments Record

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SPA	Special Protection Area, designated under the EU Birds Directive
TPC	Total Project Cost
TSO	Transmission System Operator
TSSPS	Transmission System Security and Planning Standards
UGC	Underground cable
WFD	Water Framework Directive
XLPE	Cross-linked polyethylene

## Executive Summary

**Key Points:**

- The Kildare–Meath Grid Upgrade project is needed to more effectively transfer power to the east of the country and help meet the growing demand for electricity in Kildare, Meath, and Dublin. The project is essential to enable further development of renewable energy generation in line with Government policy.
- Extensive design, surveys, consultation, and assessment were undertaken for all options.
- The Emerging Best Performing Option is Option A (Red).
- Option A (Red) was selected because:
  - it scored more favourably in terms of its overall Deliverability assessment when compared to the other options. Option A (Red) had more favourable scores in terms of Design Complexity; Dependence on Other Projects; Permits and Wayleaves; and Implementation Timelines.
  - it also has less Socio-economic (community) impacts – affecting the least amount of agricultural land, and avoids impacts that the other options would have resulted in, such as impacts to the settlement of Rathcoffey, and Ovidstown along the R403 and R406; and greater impacts to areas of amenity, such as Alexandra Bridge, near Clane.
- Further design, survey, consultation, and assessment will be undertaken to further reduce the impacts.

### This Report

EirGrid follows a six-step approach when they develop and implement solutions to any identified transmission network problem. The process and timescale of this project is show in Figure A1-1 below. The Kildare–Meath Grid Upgrade project is currently at Step 4 – Where exactly should we build? To help identify the best location for the project, Step 4 has been divided into two sub-steps: Step 4A and Step 4B. This Step 4A Report presents an analysis of the proposed route options. It describes the process followed to identify and evaluate the proposed route options. This report identifies what EirGrid, on the basis of information currently gathered, considers to be the Emerging Best Performing Option for the route of the underground cable.

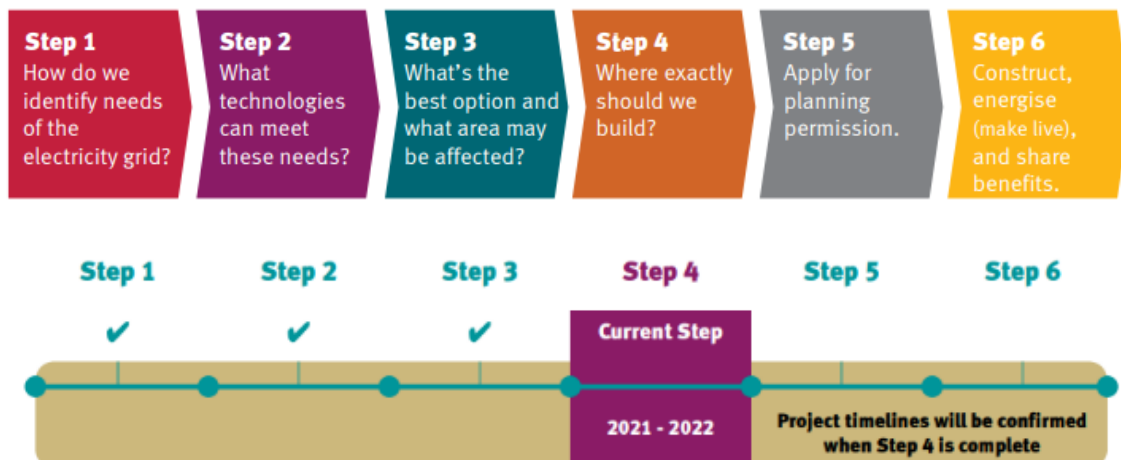


Figure A1-1: EirGrid's six-step approach and timeline for the Proposed Project

## **Introduction**

The Kildare – Meath Grid Upgrade project will help transfer electricity to the east of the country and distribute it within the network in Meath, Kildare and Dublin. The Proposed Project will add or upgrade a high-capacity electricity connection between Dunstown substation in Kildare and Woodland substation in Meath. The need for the project is integration of generation and an increase in demand on the east coast.

The project is essential to meet the Government of Ireland's Climate Action Plan target of 80% renewable energy generation by 2030, this includes transporting electricity from offshore renewable sources. It will also help meet the growing demand for electricity in the East. This growth is due to increased economic activity in the region.

A significant number of Ireland's electricity generators are in the South and South West, where many wind farms and some modern electricity generators are located. The power they generate needs to be transported to where it is needed. The power is mainly transported cross-country on the two existing 400 kV lines from the Moneypoint station in Clare to the Dunstown substation in Kildare and Woodland substation in Meath. The proposed Kildare Meath project will connect these two lines and this will strengthen the transmission network by improving reliability and security in the region.

## **Overview of Study Area**

The Study Area lies in the Mid-East Region of Ireland, specifically within the counties of Kildare and Meath. Project Ireland 2040 describes this region as having experienced high levels of population growth in recent decades, at more than twice the national growth rate. If the 2016 trend of internal migration outflows from Dublin to the other regions returns to 2006 levels, the mid-East region is projected to show the highest percentage population increases by 2036, from 690,900 to 965,300 by 2036. The manufacturing industry employs a significant number of people in the region and it is the location of high tech industries in areas such as Leixlip. The Study Area for this assessment is illustrated in Figure A1-2.

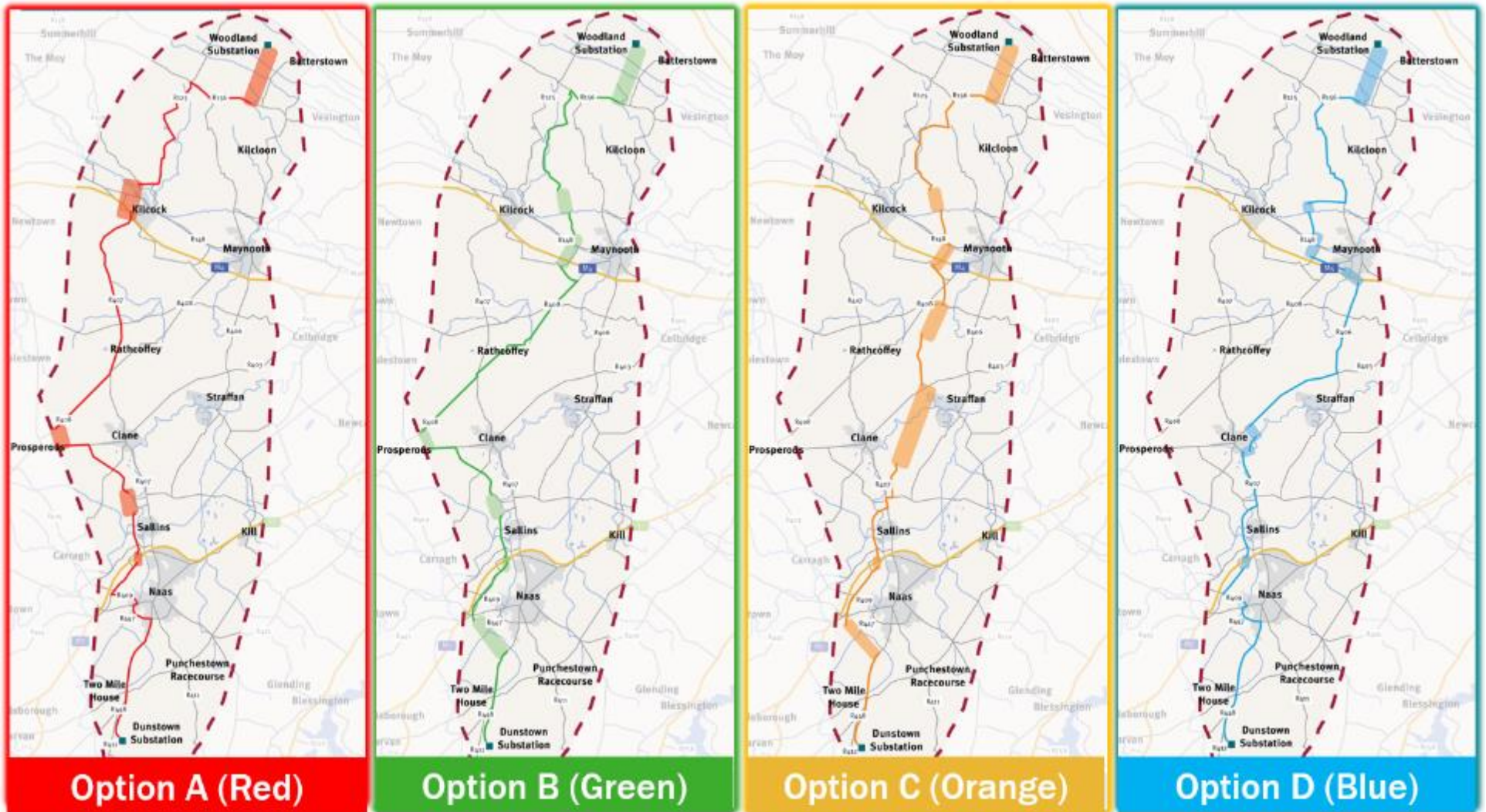


Figure A1-2: Shortlisted Options - shown in Public Consultation (2021)

## Proposed Route Options

The project team examined the Study Area to design route options between Woodland and Dunstown Substations. Site surveys, information gathered through consultations, and desktop information were used to inform the options. The design of the proposed route options was based on the following routing principles:

- Avoid motorways;
- Maximise the use of national, regional and local roads;
- Avoid town centres and industrial estates;
- Avoid going off-road, through private land and through agricultural land where possible;
- Avoid sensitive natural and built heritage locations;
- Minimise impact on communities where possible; and
- Minimise the overall length of the route.

These routing principles align with EirGrid's five key assessment criteria - Environmental; Socio-Economic; Technical; Economic; and Deliverability. In-line with the routing principles, options have avoided going off-road, through private land and through agricultural land, where possible. The balancing with the other routing principles means that there are some options which do impact agricultural land. The impacts to agricultural land have been carefully considered and a balance has been sought between impacts to farming operations, the importance of field drains and hedgerows at the edges of field for their ecological value, and technical considerations.

None of the options directly impact private dwellings or gardens and none would require demolitions of dwellings.

The four proposed route options are described and set out as follows:

**Table A1.1: Summary of Environmental Assessment for Options**

Option	Overall Length (km)	Off-road Section (km)
Option A (Red)	51.4	6.0
Option B (Green)	50.4	10.6
Option C (Orange)	46.7	15.5
Option D (Blue)	50.5	9.0

Please note that these are estimated based on the current information at the time of assessment. Further surveys, design, assessment, and consultation will be completed to determine the final length of the selected option. Further changes will be possible in order to avoid unknown utilities, at the request of landowners, to minimise environmental impacts, or for other reasons.

### Option A (Red)

Option A (Red) is the most westerly of the shortlisted cable route options and it is also the longest at 51.4km. All the shortlisted options have a common section coming out of Woodland substation.

The common section out of Woodland substation travels to the townland of Jenkinstown. At the junction of the R156 and the L1012 (Mulhussey Road), Option A (Red) is proposed to travel along the R156 to the north west towards the Mullagh Cross Roads. It will then travel south along the R125, and R158 towards Kilcock. It is proposed that Option A (Red) will pass to the west of the town of Kilcock and a potential corridor is shown on the project



mapping. In this section, crossings of third party lands are anticipated in addition to the Rye Water (at locations not designated as a Special Area of Conservation), the Royal Canal (a proposed Natural Heritage Area (NHA)), the Dublin-Sligo railway line, and the M4 Motorway will be required. It is proposed that the cable will be directionally-drilled under these to avoid potential impacts.

To the south of Kilcock, Option A (Red) is proposed to travel to the south along the R407 towards Clane. To the north of Clane at the Boherhole Cross Roads, it is proposed to take Option A (Red) to the west to avoid Clane. It is one of the project's routing principles to avoid towns and villages. Option A (Red) will travel along the R408 (the road towards Prosperous). Close to the townland of The Cott, it is proposed to route the cable across agricultural land to the south east of the R408. This is required so that the route can continue to travel to the south towards the Dunstown substation. A potential corridor is shown at this location on the project mapping. Option A (Red) will meet the R403, travelling along it until the Firmount Cross Roads, where it will continue south along the L2002. It will travel south to the new Sallins Bypass where a potential corridor is shown for a crossing of agricultural land. Along the Sallins Bypass, Option A (Red) will cross the River Liffey and Grand Canal (pNHA). A potential corridor is shown for the required crossing of the M7 Motorway.

Under the M7 Motorway, Option A (Red) will then travel along the Millennium Link Road (Western Distributor Road), travelling to the west around Naas avoiding a more direct route towards Naas town centre. Option A (Red) will connect with the R409 and travel east towards Naas, passing the Naas Sports Centre and across the Grand Canal (a proposed NHA). The proposed route then travels along the R445 and the R447 (South Ring Road). Option A (Red) connects with the R448 (Kilcullen Road) and travels south past Killashee. It meets the junction of R412 and then travels into the Dunstown substation.

### **Option B (Green)**

Option B (Green), at 50.4km in length, is similar in parts to Option A (Red) but differs in the section between the R156 to the north of Clane.

The common section out of Woodland substation travels to the townland of Jenkinstown. At the junction of the R156 and the L1012 (Mulhussey Road), Option B (Green) is proposed to travel south along the L1012 (Mulhussey Road). The route cable will pass the Mulhussey National School (St Josephs). The proposed route travels west and passes the roadside Mulhussey Castle and Cemetery toward Kiltens Gap Cross Roads. Here, the route travels south towards Rodanstown and then south east to Bryanstown. Along this road a potential corridor is shown on the project mapping where Option B (Green) will travel south to cross the Rye Water (at locations not designated as a Special Area of Conservation) and under agricultural land. Another potential corridor is shown where the route will cross the Royal Canal (pNHA), the River Lyreen, the Dublin-Sligo railway line, and M4 Motorway, avoiding Laraghbryan Cemetery. To the south of motorway, Option B (Green) connects with R408 where it will travel south west. Along this route, Option B (Green) will travel through the settlements of Rathcoffey and Moortown, then meeting with the R407 at the Boherhole Cross Roads.

It is proposed to take Option B (Green) to the west to avoid Clane as it is one of the project's routing principles to avoid towns and villages. Option B (Green) will travel along the R408 (the road to Prosperous). Close to the townland of The Cott, it is proposed to route the cable across agricultural land to the south east of the R408. This is required so that the route can continue to travel to the south towards the Dunstown substation. A potential corridor is shown at this location on the project mapping. Option B (Green) will meet the R403, travelling along it until the Firmount Cross Roads, where it will continue south along the L2002. It will travel south to the new Sallins Bypass where a potential corridor is shown for a crossing of agricultural land. Along the Sallins Bypass, Option B (Green) will cross the River Liffey and Grand Canal (pNHA). A potential corridor is shown on the project mapping for the required crossing of the M7 Motorway.

Under the M7 Motorway, Option B (Green) will then travel along the Millennium Link Road (Western Distributor Road), travelling to the west around Naas. To the south of the Southern Link Business Park, a potential corridor over agricultural land is shown at this location on the project mapping. This section of Option B (Green) will cross the Grand Canal (pNHA). Option B (Green) connects with the R448 (Kilcullen Road) and travels south past Killashee. It meets the junction of R412 and then travels into the Dunstown substation.

### **Option C (Orange)**

Option C (Orange) is the shortest of the four options at 46.7km, however, it will potentially affect much more agricultural land than the other shortlisted options.

The common section out of Woodland substation travels to the townland of Jenkinstown. At the junction of the R156 and the L1012 (Mulhussey Road), Option C (Orange) is proposed to travel south along the L1012 (Mulhussey Road). The route cable will pass the Mulhussey National School (St Josephs). The proposed route travels west and passes the roadside Mulhussey Castle and Cemetery toward Kiltens Gap Cross Roads. Here, the route travels south towards Rodanstown and then south east to Bryanstown. A potential corridor is shown on the project mapping where Option C (Orange) will travel south to cross the Rye Water (at locations not designated as a Special Area of Conservation), and under agricultural land. Another potential corridor is shown on the project mapping where the cable will cross the Royal Canal (pNHA), the River Lyreen, the Dublin-Sligo railway line, and the M4 Motorway, avoiding Laraghbryan Cemetery. To the south of motorway, Option C (Orange) crosses the R408 at Crinstown Cross Roads. It will travel south east on the L5042 until it meets the L5037 close to Maguire's Wood. At this point, a potential corridor is shown at this location on the project mapping to where the Option C (Orange) will cross under agricultural land. It will then connect with a local road in the townland of Smithtown, travelling south thorough Johninstown and Ovidstown, crossing the R403 to the north of the K Club.

Another potential corridor is shown on the project mapping travelling to the south until the townland of Blackhall. Here it travels under local roads, past the now closed Bodenstown Golf Club, and the roadside Bodenstown Cemetery, before connecting the R407. Option C (Orange) will travel along the R407 for a short length before connecting to the new Sallins Bypass. Along the Sallins Bypass, Option C (Orange) will cross the River Liffey twice and Grand Canal (pNHA). A potential corridor is shown on the project mapping for the required crossing of the M7 Motorway.

Under the M7 Motorway, Option C (Orange) will then travel along the Millennium Link Road (Western Distributor Road), travelling to the west around Naas. To the south of the Southern Link Business Park, a potential corridor over agricultural land is shown at this location on the project mapping. This section of Option C (Orange) will cross the Grand Canal (pNHA). Option C (Orange) connects with the R448 (Kilcullen Road) and travels south past Killashee. It meets the junction of R412 and then travels into the Dunstown substation.

### **Option D (Blue)**

Option D (Blue) is the second longest option at 50.5km in length and it potentially affects the least amount of agricultural land of the shortlisted options.

The common section out of Woodland substation travels to the townland of Jenkinstown. At the junction of the R156 and the L1012 (Mulhussey Road), Option D (Blue) is proposed to travel south along the L1012 (Mulhussey Road). The route will pass the Mulhussey National School (St Josephs). The proposed route travels east and then south following the L1012 until the Moyglare Road. Here it will travel west to avoid Maynooth. Along this road a potential corridor is shown on the project mapping where Option D (Blue) will travel south to cross the Rye Water



and under agricultural land. Another potential corridor is shown on the project mapping where the cable will cross Royal Canal (pNHA), the River Lyreen, and the Dublin-Sligo railway line, avoiding Laraghbryan Cemetery.

Option D (Blue) is proposed to travel parallel to the north of the M4 Motorway. It will then cross the motorway to the west of the Maynooth Junction (junction number 7) and connects to the R406. Option D (Blue) travels along this to the north of Straffan, where it meets the R403. This road will take the cable past Barberstown Castle towards Clane. Option D (Blue) will travel to the east of Clane, crossing the River Liffey but avoiding the town. A potential corridor is shown on the project mapping in this area. The route connects the R407 to the south of Clane and then connects with the Sallins Bypass. Along the Sallins Bypass, Option D (Blue) will cross the River Liffey and Grand Canal (pNHA). A potential corridor is shown on the project mapping for the required crossing of the M7 Motorway at this location.

Under the M7 Motorway, Option D (Blue) will then travel along the Millennium Link Road (Western Distributor Road), travelling to the west around Naas. Option D (Blue) will connect with the R409 and travel east towards Naas, passing the Naas Sports Centre and across the Grand Canal (pNHA). The proposed route then travels along the R445 and the R447 (South Ring Road). Option D (Blue) connects with the R448 (Kilcullen Road) and travels south past Killashee. It meets the junction of R412 and then travels into the Dunstown substation.

## Assessment of Proposed Options

Each of the proposed route options was considered against the following set of criteria:

- Environment:
  - Biodiversity;
  - Soils and Water;
  - Planning Policy and Land Use;
  - Landscape and Visual; and
  - Archaeology, Architectural Heritage and Cultural Heritage
- Socio-economic:
  - Traffic & transport;
  - Noise, Vibration and Air Quality;
  - Visual;
  - Amenity;
  - Health;
  - Employment and Economy;
  - Land-use (and Land Take);
  - Agriculture (including Equine); and
  - Utilities
- Technical;
- Deliverability; and
- Economic.

## Assessment Outcomes

Each of the proposed route options have been assessed across the constraints criteria detailed below based on the ranking approach presented below.

More significant/difficult/risk

Less Significant/difficult/risk



This risk scale is clarified by text, as follows:

- High: Dark Blue;
- Moderate-High: Blue;
- Moderate: Dark Green;
- Low-Moderate: Light Green; and
- Low: Cream.

## Environment Assessment

Table A1.2 below summarises the findings of the environmental assessment for each of the solution options. For more detail on how each individual option was appraised, please see Section 4.2, 5.2, 6.2 and 7.2, respectively.

**Table A1.2: Summary of Environmental Assessment for Options**

Option	Biodiversity	Soils and Water	Planning Policy and Land Use	Landscape and Visual	Archaeology, Architectural Heritage, and Cultural Heritage	Combined Environment Score
Option A (Red)	Moderate-High	Moderate	Moderate	Low-Moderate	Moderate-High	Moderate
Option B (Green)	Moderate-High	Low-Moderate	Low	Low-Moderate	Moderate	Low-Moderate
Option C (Orange)	Moderate-High	Low-Moderate	Low-Moderate	Low-Moderate	Low-Moderate	Low-Moderate
Option D (Blue)	Moderate-High	Moderate	Moderate	Low-Moderate	Moderate	Moderate

Overall, Option A (Red) has been scored as **Moderate (Dark Green)** in terms of risk of environmental impact. This is due to crossings within the zoned land, increased watercourse crossings, and increased cultural heritage effects (mitigation measures to reduce the effects will be considered at the next step). This route option is in proximity to the highest number Recorded Monuments (including Jigginstown Castle), Protected Structures, and Gardens and Designed Landscapes. Option B (Green) has been scored as **Low-Moderate (Light Green)** overall. This Option interacts with less zoned land than Option A (Red) as it avoids Kilcock. Option C (Orange) has been scored as **Low-Moderate (Light Green)** overall. Option C (Orange) scores higher in terms of Land Use Planning due to impacts to a solar farm application. Option D (Blue) has been scored as **Moderate (Dark Green)** overall. This is due to crossing

with zonings within the Clane and Draft Naas Local Area Plans, a longer section within the River Liffey 'Principal Landscape Sensitivity Factor'.

### Socio-economic Assessment

Outlined below are the findings of the socio-economic assessment of each of the solution options. For more information on these findings, please see Section 4.3, 5.3, 6.3 and 7.3 respectively.

**Table A1.3: Summary of Socio-economic Assessment of Options**

Option	Traffic and Transport	Noise and Vibration	Air Quality	Visual	Amenity	Health	Employment and Economy (and Tourism)	Land Use (and Land-take)	Agriculture (including Equine)	Utilities	Combined Socio-economic Score
Option A (Red)	Moderate - High	Moderate	Moderate	Low-Moderate	Low-Moderate	Low-Moderate	Low	Low	Low	Low-Moderate	Low-Moderate
Option B (Green)	Moderate - High	Low-Moderate	Low-Moderate	Low-Moderate	Moderate	Low	Low	Low	Low-Moderate	Low-Moderate	Moderate
Option C (Orange)	Moderate - High	Low-Moderate	Low	Low-Moderate	Low-Moderate	Low	Low	Low	Moderate	Low-Moderate	Moderate
Option D (Blue)	Moderate - High	Moderate	Moderate	Low-Moderate	Moderate-High	Low-Moderate	Low	Low	Low-Moderate	Low-Moderate	Moderate-High

Option A (Red) will pass less properties than Option D (Blue) and will require less full road closures compared to Options B and C. However because more of its length is in regional roads, construction traffic disturbance will be comparatively greater due to the increased traffic using those roads. Mitigation measures to reduce the effects will be considered at the next step. Option A (Red) has the least significant agricultural land issues as in crosses the least amount of agricultural/private land. Option B (Green) travels through the settlement of Rathcoffey, which will result in disruption to this settlement during the construction phase. Option C (Orange) is considered to have a similar combined social impact to Option A (Red) and Option B (Green), however individual social impacts are more similar to Option B (Green) than Option A (Red). As such, it has been assigned a **'Moderate (Dark Green)'** score. Option D (Blue) passes the greater number of properties than the other options; has a greater visual impact at Alexandra Bridge; passes along the R403 and R406 which are densely populated and importance routes for local and regional traffic. It has been assigned a **Moderate – High (Light Blue)** score.

### Technical Assessment

For more information on these findings, please see Section 4.3, 5.3, 6.3, and 7.3 respectively.

**Table A1.4: Summary of Technical Assessment of Options**

Option	General Compliance	Headroom	Maintainability	Technology Operational Risk	Average Reliability Rates	Repeatability	Combined Technical Score
Option A (Red)	Low	Low	Low	Low	Low	Low	Low
Option B (Green)	Low	Low	Low	Low	Low	Low	Low
Option C (Orange)	Low	Low	Low	Low	Low	Low	Low
Option D (Blue)	Low	Low	Low	Low	Low	Low	Low

At this stage in the Proposed Project, are there no technical differentiations apart from the number of major crossings. All four of the options are technically sound and could be constructed in-line with EirGrid’s technical standards. Options A (Red) and B (Green) will have two fewer than Options C (Orange) and D (Blue). However this may not present a technical issue in terms of the rating of the cable. Other technical factors will have no impact on the selection of the best performing option. Each of the four options have been assessed to have a **Low (Cream)** score for the technical criterion. This demonstrates that only technically sound options have been taken forward for assessment. Further assessment of the Emerging Best Performing Option in terms of the technical criterion will be undertaken through the next steps of the Proposed Project.

### Deliverability Assessment

Outlined below are the findings of the deliverability assessment of each of the solution options. For more information on these findings, please see Section 4.4, 5.4, 6, and 7.4 respectively.

**Table A1.5: Summary of Deliverability Assessment of Options**

Solution Option	Design complexity	Traffic disturbance	Dependence on other infrastructure projects	Permits and wayleaves	Implementation Timelines	Combined Deliverability Score
Option A (Red)	Low-Moderate	Moderate-High	Low-Moderate	Low-Moderate	Low-Moderate	Low-Moderate
Option B (Green)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Option C (Orange)	High	Moderate-High	Moderate	Moderate-High	Moderate-High	High
Option D (Blue)	Moderate -High	Moderate	Moderate -High	Low- Moderate	Moderate	Moderate

Considering the design complexity, traffic disturbance from temporary construction traffic, impact dependence and implementation timelines, a rating of **'Moderate-High' (Light Blue)** has been assigned. Option A (Red) has generally scored well (Low-Moderate) over all in the Deliverability sub-topics, however the impact in terms of construction traffic disturbance has elevated the overall score. Option A (Red) has the least amount of off-road section and impacts more regional roads than the other options, meaning fewer full road closures than Options B and C.

### Economic Assessment

Outlined below are the findings of the economic appraisal of each of the solution options. For more information on these findings, please see Section 4.5, 5.5, 6.5, and 7.5 respectively.

**Table A1.6: Summary of Economic Assessment of Options**

Route Option	Length of Installed Cable	Quantity of Crossings	Combined Economic Score
Option A (Red)	Moderate	Low	Low-Moderate
Option B (Green)	Moderate	Low	Low-Moderate
Option C (Orange)	Low	Moderate-High	Low Moderate
Option D (Blue)	Moderate	Moderate-High	Moderate-High

At this stage in the Proposed Project, the only differentiations between route options are cable route lengths and the impact from the quantity of expected major crossings. Option A (Red) has been assessed to have a **Low-Moderate (Light Green)** score for the economic criterion due to the fewer HDDs balancing out the longer length of the route when compared to the shortest Option C.

### Conclusion

**Table A1.7: Assessment Summary**

Option	Environment Score	Socio-economic Score	Technical Score	Deliverability Score	Economic Score
Option A (Red)	Moderate	Low-Moderate	Low	Low-Moderate	Low-Moderate
Option B (Green)	Low-Moderate	Moderate	Low	Moderate	Low-Moderate
Option C (Orange)	Low-Moderate	Moderate	Low	High	Low-Moderate
Option D (Blue)	Moderate	Moderate-High	Low	Moderate	Moderate-High

It was determined that Option A (Red) would be selected as the Emerging Best Performing Option. This is due to several factors including its better Socio-Economic and Deliverability scores compared to the other options. These lower Socio-economic impacts means that there will be less impacts to communities including the farming community. While it is the longest of the four options, it passes fewer properties compared to Option D (Blue) and it has fewer major crossings (such as HDD) compared to Options C and D. It also impacts the least amount of agricultural land of the four options. Additionally, by crossing less agricultural land, there are likely to be fewer impacts to hedgerows and treelines, and therefore reduced ecological and landscape effects. While Option A (Red) has increased cultural heritage and temporary construction traffic impacts compared to the other options, further survey, consultation, design, and assessment work will be undertaken to reduce and/or avoid the impacts.

## Consultation Feedback on Option A (Red)

In terms of Option A (Red), many respondents expressed their support for this option, stating that in general terms Option A (Red) was the 'best option' or a 'reasonable' option. A few respondents stated that Option A (Red) represented the most direct route by following existing roads and many respondents highlighted that Option A (Red) would have less of an impact on the surrounding area than the other proposed options. Some of these respondents stated that Option A (Red) would be less disruptive to local communities, arguing that less landowners would be affected and that the option would not contribute to traffic in areas that are already experiencing congestion, such as Sallins, Clane and Kilcock. Many respondents outlined that the additional length of Option A (Red) compared to other options was acceptable, as this option would not impact on high-output soils, and would therefore have the least impact on agricultural land. These respondents stated that agriculture is an important sector in this area. In addition, a small number of respondents stated that Option A (Red) would have less of an environmental impact than the other options given the fact that there is a lower estimated figure for off-road sections.

## Summary

In summary, Option A (Red) was selected as it scored more favourably in terms of Deliverability compared to the other options. Option A (Red) generally scored more favourably in four of the Deliverability topics compared to the other options – Design Complexity; Dependence on Other Projects; Permits and Wayleaves; and Implementation Timelines. Option A (Red) did score more highly or equal for Traffic Disturbance because it has the most amount road sections and impacts more regional roads than the other options, which will increase traffic disturbance. While the traffic impacts will be temporary and restricted to the construction phase, in order to minimise the disturbance, traffic surveys will be undertaken to confirm this assumption. Other survey and design work will be completed to confirm the assumptions made on the required working area. In addition, localised route changes could be designed and assessed to minimise impacts further. Consultation will be undertaken with Meath and Kildare County Councils to agree the approach to traffic management and avoid and/or reduce the impacts.

Option A (Red) also has less Socio-economic (community) impacts compared to other options. This is reinforced by the feedback received from respondents during the consultation period. Option A (Red) impacts the least amount of agricultural land, and avoids concerns that the other options would have resulted in, such as impacts to the settlement of Rathcoffey, and Ovidstown along the R403 and R406; and greater impacts to areas of amenity, such as Alexandra Bridge, near to Clane. Further design, survey, consultation, and assessment will be undertaken to further reduce the impacts and maintain engagement with stakeholders in the project area.

## Next Steps

The following actions will be completed on the Proposed Project:

- This Step 4A report will be published and any feedback will be considered by the project team and amendments will be made where it is considered appropriate;
- EirGrid will meet with affected landowners (subject to Covid protocols) to discuss the Proposed Project to seek agreement on the way forward. Further meetings will also be held with bodies such as Meath and Kildare County Councils, TII, Irish Rail, Waterways Ireland, and the utility providers such as Irish Water and Gas Networks Ireland;

- The project team will undertake a wide range of surveys to help to refine the design and location of the proposed cable. This will also include designing how the cable will be constructed and how traffic disturbance will be minimised through traffic management. The surveys include archaeology, ecology, agriculture, ground investigations, utilities surveys, hydrology, technical assessments, etc. These surveys will likely result in changes to the route shown in this report. This is a normal part of the design process – as further information is gathered, new issues can be identified resulting in changes to the route. The changes are likely to be minor in nature and will not affect the conclusion that Option A (Red) is the Emerging Best Performing Option. If large scale changes are required, then the assessment will be remade, and further consultation will be undertaken;
- Further design work will be progressed at the substations to determine the works required to connect the proposed cable into the grid;
- When the proposed cable route and design have been progressed further, a further report called the Step 4B report will be published for public consultation. This will allow further comments on the proposed route which will be addressed by the project team. The Step 4B report is likely to be published in the middle of 2022; and
- Following that, the project team will prepare the planning submission for the Proposed Project. Further updates will be published by EirGrid on the project website:  
[www.eirgridgroup.com/the-grid/projects/capital-project-966/the-project/](http://www.eirgridgroup.com/the-grid/projects/capital-project-966/the-project/)

## 1. Introduction

### 1.1 The Proposed Project

The Kildare – Meath Grid Upgrade project (referred to as the 'Proposed Project' in this Report) will help transfer electricity to the east of the country and distribute it within the network in Meath, Kildare and Dublin.

The Proposed Project will add or upgrade a high-capacity electricity connection between Dunstown substation in Kildare and Woodland substation in Meath. The project is essential to meet the Government of Ireland's Climate Action Plan target of 80% renewable energy generation by 2030, this includes transporting electricity from offshore renewable sources. It will also help meet the growing demand for electricity in the East. This growth is due to increased economic activity in the region.

A significant number of Ireland's electricity generators are in the South and South West, where many wind farms and some modern electricity generators are located. The power they generate needs to be transported to where it is needed. The power is mainly transported cross-country on the two existing 400 kV lines from the Moneypoint station in Clare to the Dunstown substation in Kildare and Woodland substation in Meath (shown in Figure 1-1).



Figure 1-1: Cross-country 400 kV lines

To solve this emerging issue, EirGrid needs to strengthen the electricity network between Dunstown and Woodland to avoid capacity and voltage problems.



The Proposed Project aims to strengthen the transmission network between Dunstown and Woodland substations - and suggests a number of technical solutions to do so. EirGrid has identified that the Proposed Project will have the following benefits:

- Community - Deliver community benefit in the areas that facilitate the project infrastructure;
- Competition - Apply downward pressure on the cost of electricity;
- Sustainability - Help facilitate Ireland's transition to a low carbon energy future;
- Security of Supply - Improve electricity supply for Ireland's electricity consumers; and
- Economic - Contribute to the regional economy and support foreign direct investment.

The need for the Proposed Project has been established through a series of reports completed at Steps 1 to 3 (see Figure 1-2 below for reference). These reports are available on the project website<sup>1</sup>. This series of studies identified the need for a new connection between Woodland and Dunstown substations and that an underground cable would be the best technology for this connection. The Proposed Project is a high voltage (400 kV) underground cable between Woodland and Dunstown substations and the need for the project remains robust.

## 1.2 Construction of the Project

All four proposed route options have been assessed to be buildable, reasonable, and practicable. Detailed designs will need to be produced with regards to alignment and build-up in the next steps on the Proposed Project.

Further design will be undertaken at the next steps in the Proposed Project. This work will refine the location and nature of the construction works and allow an assessment of the environmental impacts of the Proposed Project. The further design will include matters such as construction sequencing, traffic management, management of excavated material, and construction compounds, and ensuring existing utilities and structures are not affected.

Consultations have already started with statutory bodies such as Iarnród Éireann (Irish Rail) and Transport Infrastructure Ireland (TII) and the local road authorities Kildare County Council and Meath County Council. Utility operators have been contacted for the location of their services and further consultations will be undertaken.

Each of the four proposed route options will have significant groundworks associated with them whether that is following carriageways or across agricultural land. Due to the nature of this type of construction works there will be a requirement to temporarily stockpile large amounts of the excavated material during the ongoing works and will need to be factored into the site setups and planning boundaries.

Dependent on road conditions and highways specification, there could be opportunity to reuse the initially removed asphalt surface, treatment and conditioning and returning to be used as a temporary road surface before the final permanent surface is applied. This would require an agreed crushing and treatment suite suitable for the chosen route, however, would ensure that vehicles being used for the transport of aggregate and fills are used at peak optimum (i.e. always travelling with a load) and may reduce the overall carbon footprint of the scheme and disruption to neighbours.

All four of the proposed route options require two crossings of railway lines, two crossings of motorways, and three crossings of canals (Royal Canal once, and the Grand Canal twice). These crossings are not key differentiators in the assessment between the proposed route options.

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<sup>1</sup> <https://www.eirgridgroup.com/the-grid/projects/capital-project-966/related-documents/>

A proposed construction sequence and methodology for the Proposed Project is as follows:

- Setup traffic management (road closure / lane closure / diversions);
- Saw cut and remove road surface;
- Address any existing utilities (the details will be confirmed with utility owners);
- Excavate trench (2.1m wide by 1.3m deep approximately);
- Install concrete base;
- Install ducts for High Voltage cables and control / pilot cables;
- Install concrete surround to ducts;
- Installation of cable identification tape / tiles;
- Back fill and compacting;
- Resurfacing and lining of the road surface; and
- Removal of traffic management.

These activities would then be repeated until a cable jointing bay is needed to be installed. Cable jointing bays will be provided approximately every 650m and will allow sections of cable to be linked together as well as providing future access points for maintenance. The jointing bays are installed below ground at fixed intervals corresponding to the cable length. Joint bays are firstly installed and then later for use subsequently in cable installation and jointing. The jointing bays can be constructed in a number of different ways – one method is to use prefabricated joint bays or precast bays which can be delivered to site and lifted into position. Passing bays will be located and assessed at the next step of the project. These temporary passing bays will be located adjacent to jointing bays and will allow traffic to flow around the bay during its construction, reducing the need for diversions or road closures.

Following the installation of ducts and jointing bays, the following activities occur:

- Pulling the cables into the ducts;
- Jointing of the cables; and
- Testing and commissioning of the entire cable at the end of the construction phase but prior to the operational phase.

Associated works will be required at a number of substations including Woodland and Dunstown. These works continue to be scoped and will be determined in the next step of the Proposed Project and are not part of this report. It should be noted that the selected route option for the Proposed Project will continue to be refined until the planning application is submitted. Changes may be made for technical reasons (e.g. crossing a watercourse), the results of environmental surveys, or through consultations with affected landowners. Should changes be made, these will be fully communicated through the reports, planning application, landowner meetings, and public consultations.

Overall, it is estimated that the construction of the Proposed Project will have a duration of two to three years assuming no unforeseen delays. The construction duration will be refined at the next step of the Proposed Project (i.e. Step 5) when further design and assessment will be carried out.

## 1.3 Purpose of this Step 4A Report

EirGrid follow a six-step approach when they develop and implement the best performing solution option to any identified transmission network problem. This six-step approach is described in the document 'Have Your Say' published on EirGrid's website<sup>2</sup>. The six steps are shown at a high-level in Figure 1-2. Each step has a distinct purpose with defined deliverables and represents a lifecycle of a development from conception through to implementation and energisation.

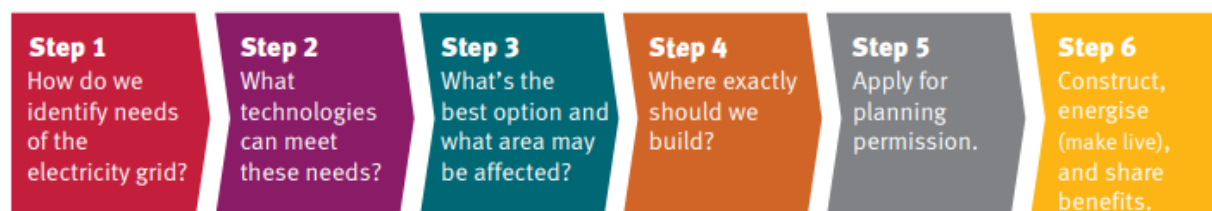


Figure 1-2: EirGrid's six-step approach to developing the electricity grid

The Proposed Project is currently in Step 4, where the project team in consultation with stakeholders and the community identifies exactly where the underground electricity connection will be built. The timeline for Step 4 can be seen in Figure 1-3.

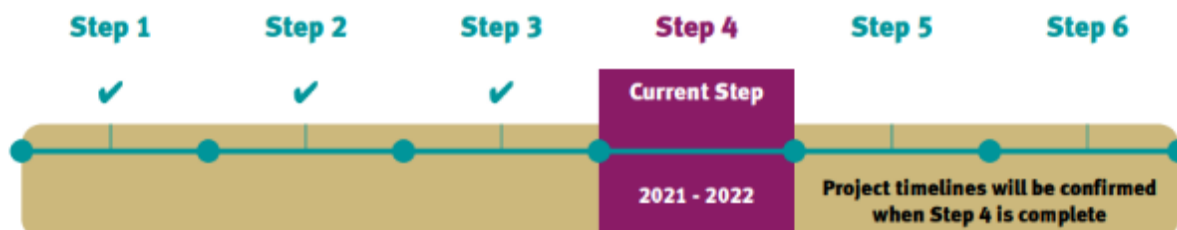


Figure 1-3: EirGrid's six-step timeline for the Proposed Project

In Step 1, EirGrid identified the need for the Proposed Project.

In Step 2, EirGrid compiled a shortlist of best performing technical options, which went out for public consultation between November 2018 and February 2019. This included a mix of overhead line, underground cable and upvoltage technologies. Four of those options were taken forward to Step 3 in April 2019.

In Step 3, EirGrid re-confirmed the need for the Proposed Project and investigated and consulted on the shortlisted technology options to strengthen the electricity network between the Woodland and Dunstown substations. In April 2021, EirGrid identified the 400 kV underground cable option as the best performing option to progress for this Proposed Project.

<sup>2</sup> <http://www.eirgridgroup.com/the-grid/have-your-say/>

As part of Step 4, EirGrid has identified four potential underground cable route options and have consulted on these. The four proposed route options are being assessed against five key assessment criteria:

1. Environmental factors;
2. Socio-economic factors – such as the local economy and local amenities;
3. Technical aspects;
4. Deliverability factors – such as timeline and potential risks; and
5. Economic factors.



**Figure 1-4: EirGrid's Five Assessment Criteria for Projects**

Step 4 has been divided into two sub-steps: Step 4A and Step 4B. This Step 4A Report presents an analysis of the proposed route options. It describes the process followed to identify the proposed route options and presents a comparative evaluation of those sites against a set of criteria. This report identifies what EirGrid, on the basis of information currently gathered, considers to be the Emerging Best Performing Option for the route of the underground cable. This report will be published and EirGrid will consider all feedback arising and will use this, and any further survey and analysis undertaken, to confirm the Best Performing Option at Step 4B. The Best Performing Option will be the route option taken forward to the planning process (and Step 5 of the six-step development process).

### **Sustainability**

There is no national guidance on the assessment of sustainability within infrastructure projects and so this section outlines the approach that has already been completed on the Proposed Project and that will be completed in future steps. The assessment of sustainability issues will be completed at a level of detail appropriate to this Step (i.e. Step 4) of the Proposed Project. Further details on design, materials and impacts such as exact area of land-take and social effects will be available at the next Step of the Proposed Project and they will be assessed appropriately at that time.

Chapter 2 of this report outlines how the options have been developed for the Proposed Project. The routing principles, as specified in Section 2.2, establish how the proposed route options considered social, economic, and environmental issues from the outset, and therefore had sustainability at the core of the process. Examples such as avoiding designated sites and towns, minimising the length of the route to reduce impacts and cost, and avoiding

agricultural land where possible show how the selected route options considered a blend of sustainability issues. Further details are provided in Chapter 2 of this report.

Assessment against EirGrid's five assessment criteria (Environment; Socio-economic; Technical; Deliverability; and Economic – as identified in Section 2.3 of this report) is the key to the consideration of sustainability on the Proposed Project. These five assessment criteria address economy, society, and environment (key sustainable development considerations) and ensure that this Step 4A Report has sustainability fully addressed in the selection of the preferred route. The assessment of the proposed route options is provided in Chapters 4 - 7 of this report.

Community involvement is another key consideration in sustainability. EirGrid has met with affected landowners directly, held online presentations, hosted interactive mapping on a dedicated project website, visited nine communities with their Mobile information unit, and invited members of the public and statutory bodies to submit comments and queries on the Proposed Project. A community forum has been established to identify local community representatives and obtain feedback through regular engagement. Further details on the consultation process are provided in Section 2.2.4 of this report.

In the next step of the Proposed Project (i.e. Step 5), further consultation, surveys, design, and assessment will be undertaken as the Proposed Project evolves. There will be further details available for consideration and these details will be assessed following national guidelines and legislation. In addition, further updates will be provided to the application of the United Nations Sustainable Development Goals. Ultimately the Proposed Project will be submitted for due consideration through the planning process. The planning permission application that is submitted will be accompanied by environmental reports that outline the impacts of the Proposed Project and what mitigation will be in place to reduce or remove these impacts.

### Accompanying Reports

The following reports accompany this Step 4A Report:

- Jacobs. 2021. Step 4A Environmental Constraints Report. Available at:  
<https://consult.eirgrid.ie/system/files/materials/2055/Environmental%20Constraints%20Report%20-%20Step%204A%20-%20KMGU.pdf>
- Jacobs. 2020. Cable Feasibility Report. Available at:  
<https://www.eirgridgroup.com/site-files/library/EirGrid/Cable-Feasibility-Report.pdf>
- Traverse. 2022. Consultation Summary Report.  
<https://www.eirgridgroup.com/the-grid/projects/capital-project-966/related-documents/>

## 1.4 Structure of this Report

This report is structured as outlined in Table 1.1.

**Table 1.1: Report Structure**

Section	Overview
Executive Summary	A summary of the report.
Chapter 1 Introduction	An outline of the report, a description of the Proposed Project; information on the approach to its development, as well as information on sustainability relevant to the Proposed Project.
Chapter 2 Methodology and Approach	An explanation of how the options were designed and assessed, and what process was followed: <ul style="list-style-type: none"> <li>• Constraints mapping;</li> <li>• Designing short route sections;</li> <li>• Combining the route sections to create four end-to-end route options; Options A to D; and</li> <li>• Public consultation.</li> </ul>
Chapter 3 Route Identification	A description of the Route Section Assessment, Public Consultation, and the End-to-End Assessment – the route option designs, and the findings of the assessment.
Chapter 4 Option A (Red)	The assessment of the options against the five assessment criteria: environment, socio-economics, technical, deliverability and economic.
Chapter 5 Option B (Green)	
Chapter 6 Option C (Orange)	
Chapter 7 Option D (Blue)	
Chapter 8 Emerging Best Performing Option and Conclusion	A comparison of the four route options (Option A – D) and the selection of the Emerging Best Performing Option with an explanation of why it has been selected.
Appendices	Supporting information for the text of this report.
Figures	Supporting maps and drawings. Some figures are inset within the text and some are stand-alone at the end of the report.

## 2. Methodology and Approach

### 2.1 Introduction

As detailed in Section 1.3, this Step 4A Report presents an analysis of the proposed route options which were shortlisted in Step 3 (in accordance with EirGrid’s Framework for Grid Development). As noted in Section 1, the aim of this process is to identify the location of an Emerging Best Performing Option. The following sections of this report outline how the proposed route options were designed and how they were assessed. The proposed route options are described in Chapter 3 and assessed in the subsequent chapters.

### 2.2 Identification of Options

This approach to route options identification and appraisal is a best practice approach to the Consideration of Alternatives for a linear infrastructure project and a key tenant of EirGrid’s Framework for Grid Development. The Proposed Project has not yet been subject to a screening to determine if an Environmental Impact Assessment (EIA) is required. This will be at the next step of the Proposed Project (i.e. Step 5). The EIA Directive 2014/52/EU requires that an EIA in respect of a Proposed Project outlines the reasonable alternatives studied by the developer, which are relevant to the Proposed Project and its specific characteristics, and gives an indication of the main reasons for the option chosen, taking into account the impacts of the Proposed Project on the environment.

‘Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment’ (August 2018) as prepared by the Department of Housing, Planning and Local Government confirms that “reasonable alternatives” may relate to matters such as project design, technology, location, size, and scale. The purpose of considering alternatives is to provide a framework for sound decision-making based on the principles of sustainable development, and to find the most effective way of meeting the need and purpose of a project, which enhances the environmental benefits of the planned activity, while avoiding, reducing or remediating potentially significant negative environmental impacts.

The proposed route options have been designed using the Proposed Project’s Geographical Information System (GIS), which allows known relevant data and constraints to be easily mapped and route options drawn to minimise the impacts. The first step in the design is the avoidance of key social and environmental constraints, in so far as possible. Examples of social and environmental constraints include cultural heritage features, community facilities such as GAA clubs, and community halls; , and many more. the width and quality of the road; other services in the road such as water, gas and drainage; impact on the environment including European and nationally protected areas for biodiversity, invasive and protected species and other important biodiversity areas (including undesignated habitats); City and County Development Plans and Local Area Plans; areas of high amenity; and ongoing works. These locations were identified in the *Environmental Constraints Report*<sup>3</sup> for the Proposed Project, which was published for consultation in August 2021. Environmental and social constraints have been updated site surveys by the project team, through the consultation process, and through iterative reviews of the Study Area.

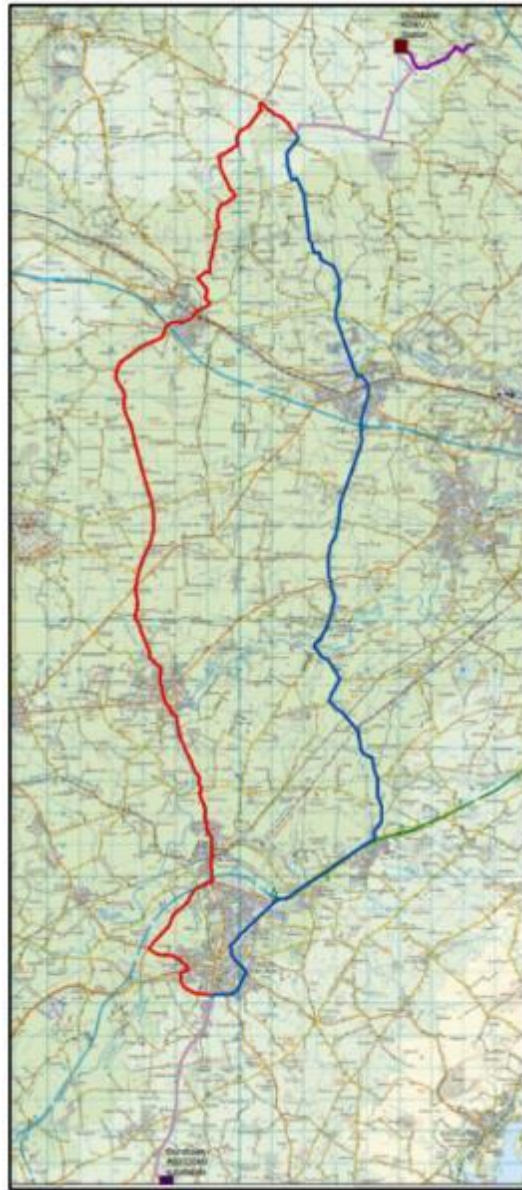
In Step 3, two feasible route options for an underground cable were published<sup>4</sup> as part of the assessment of the technology options for the Proposed Project. The two feasible route options are shown in Figure 2-1 below. These route options were subject to a high-level assessment and it was intended that these two route options would be subject to change as the Proposed Project evolved. The routes shown were indicative and identified as part of a feasibility exercise only using the existing road network to facilitate discussion on an underground cable route feasibility .

<sup>3</sup> Jacobs. 2021. Step 4A Environmental Constraints Report. Available at:

<https://consult.eirgrid.ie/system/files/materials/2055/Environmental%20Constraints%20Report%20-%20Step%204A%20-%20KMGU.pdf>

<sup>4</sup> Jacobs. 2020. Cable Feasibility Report. Available at: <https://www.eirgridgroup.com/site-files/library/EirGrid/Cable-Feasibility-Report.pdf>





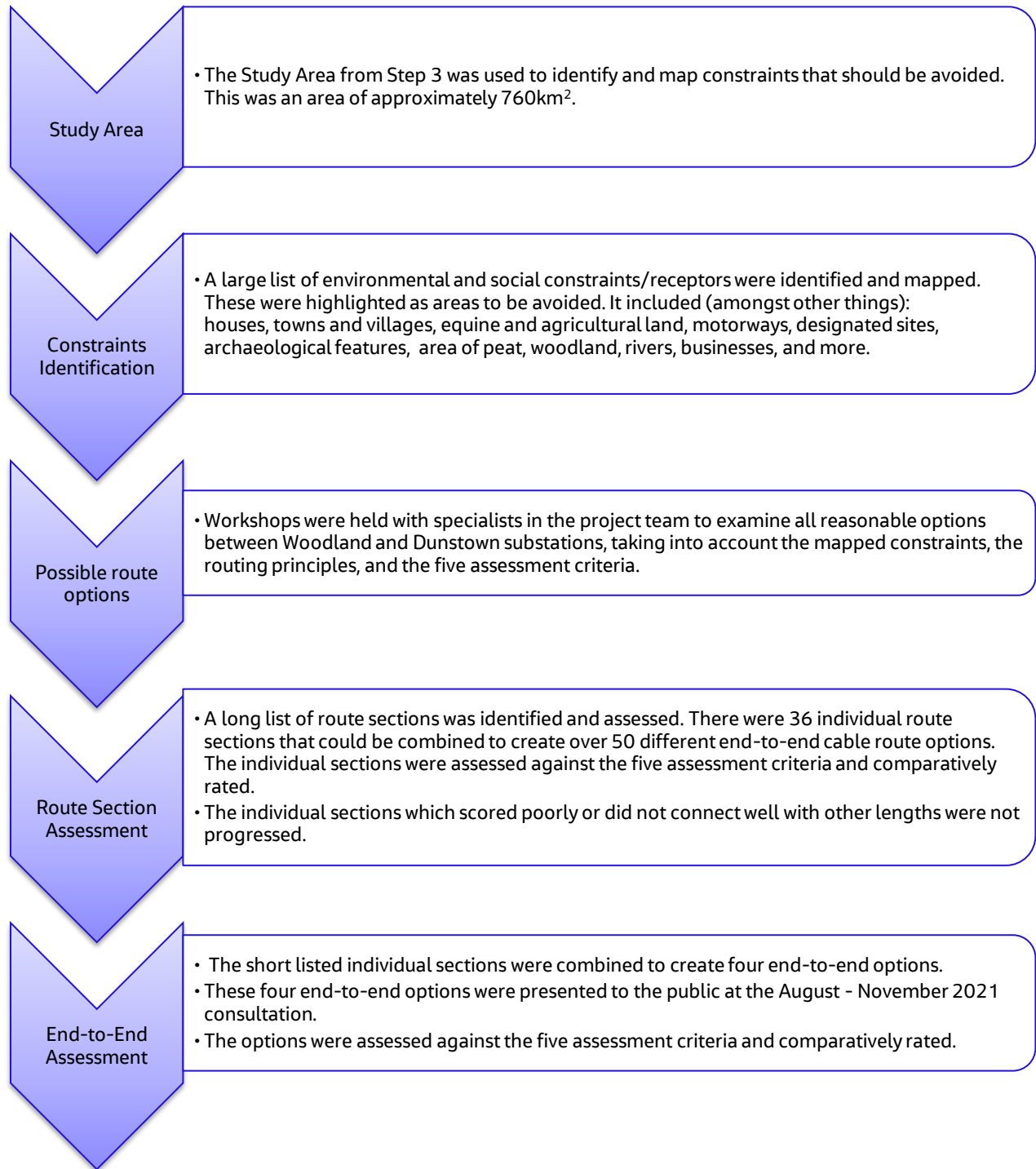
**Figure 2-1: Step 3 Feasible Cable Options (extracted from the Step 3 Cable Feasibility Report for the Proposed Project).**

In Step 4, the project team re-examined the Study Area to design improved route options from the two feasible route options established during Step 3. The design of the proposed route options at Step 4 were based on the following routing principles:

- Avoid motorways;
- Maximise the use of national, regional and local roads;
- Avoid town centres and industrial estates;
- Avoid going off-road, through private land and through agricultural land where possible;
- Avoid sensitive natural and built heritage locations;
- Minimise impact on communities where possible; and
- Minimise the overall length of the route.

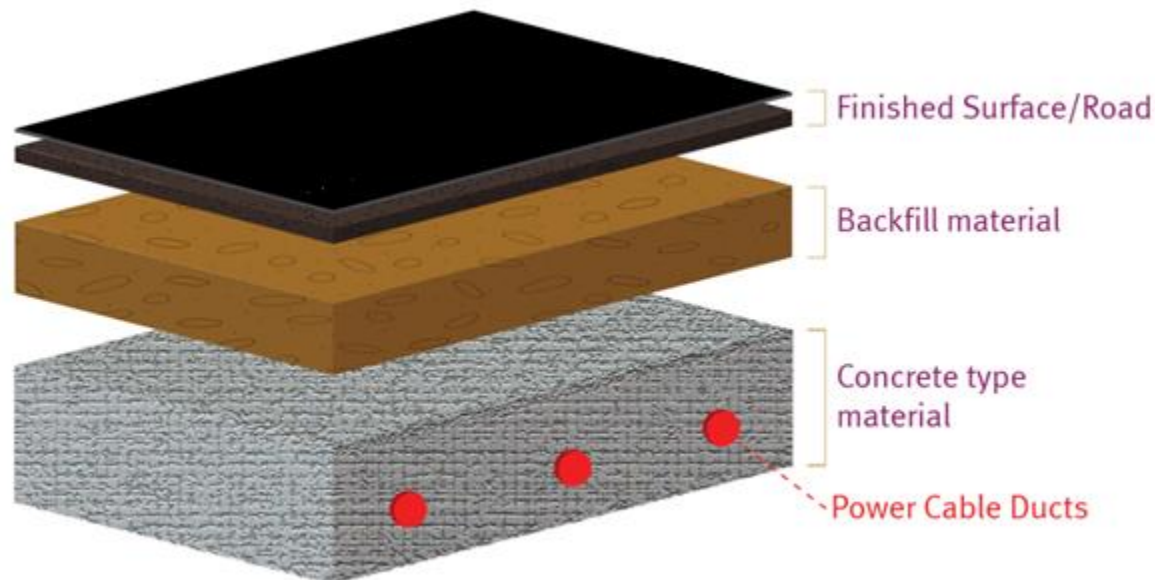


These routing principles align with EirGrid’s five key assessment criteria - Environmental; Socio-Economic; Technical; Economic; and Deliverability. These are outlined in Section 2.3 below in more detail. By following the routing principles, improved route options were designed. Figure 2-2 outlines the process that was followed and further detail on the process is provided below.



**Figure 2-2: The Route Design Process for Step 4A**

For the purposes of this route option assessment, a trench width of 2.1m was assumed. Figure 2-3 below shows an indicative High-Voltage Alternating Current (HVAC) cable.



**Figure 2-3: Indicative High-Voltage Alternating Current (HVAC) Cable Duct Arrangement (single conductor per phase solution)**

A trench of 2.1m is the typical maximum estimated width and further studies may reduce this width. In certain circumstances, where there is a constraint on the route such as a river, the width may be increased to avoid constraints.

## 2.2.1 Constraints Identification

As part of the Public Consultation (August – November 2021) for this step of the Proposed Project (i.e. Step 4), an Environmental Constraints Report was prepared and published. The purpose of the Environmental Constraints Report was to review and update the constraints identified in Step 3, and ensure they were considered appropriately in the determination of the Emerging Best Performing Option for the Proposed Project. The objective of the Environmental Constraints Report was to identify the international, national, county, and local constraints that would need to be taken into account to better inform the design of the Proposed Project. .

The project team used site visits, consultation, online mapping, and GIS to ensure that details are not missed and would be fully taken into account in when developing potential route options. This mapping is available for public viewing on the EirGrid website<sup>5</sup>.

The Environmental Constraints Report identified the following constraints:

- Socio-Economic Factors:
  - Planning Policy and Legislation;

<sup>5</sup> <https://www.eirgridgroup.com/the-grid/projects/capital-project-966/the-project/>

- Amenity and Human Health (including population);
- Economy (including employment, economic sectors and tourism);
- Agronomy and Equine;
- Other Land Use (including settlements, forestry, bogs, peats, horticulture);
- Electric and Magnetic Fields (EMF);
- Transport; and
- Utilities and Critical Infrastructure (non-transport related).
- Environmental Factors:
  - Biodiversity,
  - Geology, Soils and Groundwater;
  - Water;
  - Flood Risk;
  - Noise;
  - Air Quality;
  - Landscape and Visual; and
  - Archaeology, Architectural Heritage, and Cultural Heritage.

## 2.2.2 Route Section Assessment

With the features mapped and routing principles established, the project team designed potential route options. Because of the large number of potential route options, it was decided that the proposed route options would be broken down into shorter sections first, and then assessed. Thirty-six individual route sections were designed and labelled for the nodes<sup>6</sup> they connected (for example the section between Nodes A and B was labelled as Route Section AB).

This process has been described as like building with bricks. The individual bricks can be swapped out or added together to make something larger. The shorter route sections could be added with other sections to create longer route sections. For example, the route section between Nodes A and B could be added to the length B to C and then C to D. The route section approach (sometimes referred to as the 'node-to-node' approach) allows greater flexibility in the design and subsequent assessment of route options. In addition, constraints can be more easily avoided by switching to a different route section, and the routing principles could be followed more closely.

Following the completion of the Route Section Assessment, a review of the Project Study Area was undertaken. The Step 2 Study Area was the largest Study Area initially, however this was refined at Step 3 to better reflect a more focussed development of the Proposed Project. The Step 3 Study Area decreased the size of the initial project Study Area to roughly 760km<sup>2</sup>. The Step 3 Study Area was used for the Route Section Assessment.

The Route Section Assessment identified all route sections within the Step 3 Project Study Area that were available to the Proposed Project. A number of these route sections, mainly those in the central and eastern portions of the Step 3 Project Study Area, avoided many key environmental and social constraints and were considered feasible from a technical and deliverability standpoint. Route sections in the western portion of the Step 3 Project Study Area were considered unnecessarily distant from either Woodland or Dunstown substations and also closer to a

<sup>6</sup> Nodes are points where two or more route sections meet.

larger number of environmentally designated sites. As a result it was determined that no route sections in the western portion of the Step 3 Project Study Area should progress and that the Project Study Area was to be refined further to better inform the Step 4 assessment. This further refined Project Study Area would be described as the 'Step 4 Project Study Area'.

The Step 4 Project Study Area is roughly 340km<sup>2</sup> – a reduction of approximately 55% from the Step 3 Project Study Area, reflecting the location of the route section. Any assessments of these route sections would be unaffected by any changes in Project Study Area from Step 3 to Step 4. In-line with national guidance (in the context of Environmental Impact Assessment)<sup>7</sup>, impacts would be assessed regardless of whether they occur inside the Study Area or outside it, where applicable. The changes to the Study Area were made to focus in on the key constraints of the project and better identify the communities closest to the route options.

The assessment of route sections was based on the five key assessment criteria (Environmental; Socio-Economic; Technical; Deliverability; and Economic (see Section 2.3 for further details). Because of the use of GIS, a large amount of environmental, social and technical data was collected on each route section. This included the number of houses along each route section, how many watercourses it crossed, the geology of the route section, how many archaeological sites were within 25m, 50m, 200m, etc. The data collected is presented in Appendix B.1 of this report. This data helped to assess the individual route sections. Environmental specialists used this data and their professional judgment to identify the potential impacts / difficulties / risk of each route section and to assign it a ranking based on the process outlined in Section 2.3 of this report. Route sections which had more significant impact / greater difficulties / more risk were not progressed. This process is outlined in Chapter 3 of this report.

### 2.2.3 End-to-End Assessment

By the end of the Route Section assessment, better performing route sections could be added together to create end-to-end options. The End-to-End assessment considered longer route options travelling from Woodland substation to Dunstown substation. The four (End-to-End) route options which were presented to the public in the Step 4A consultation were identified through this process. These four route options are assessed in Chapters 4 to 7 of this report. The four options share some common sections in certain areas (e.g. on approach to Woodland substation and crossing the M7 at Naas). This is because the route sections at these locations were assessed to be the best performing and therefore have been used in all four options. Other alternative route sections at these locations were explored in accordance with the process described above and were ruled out.

The four options presented to the public are shown in Section 2.2.4 below. The off-road sections within the options were shown as larger potential corridors. This was because consultations were required with affected landowners and further assessment was required.

### 2.2.4 Public Consultation (August – November 2021)

EirGrid's approach to public consultation was to try to safely reach as many people as possible while taking into account Covid restrictions at the time. The project team facilitated in person meetings and also online methods to reach as wide an audience as possible. Public Consultation was promoted through Community Forum meetings, onsite engagement in the project area, stakeholder engagement, public webinars, multi-channel advertisements

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<sup>7</sup> Environmental Protection Agency. 2017. Draft Guidelines on The Information to be Contained in Environmental Impact Assessment Reports. [https://www.epa.ie/publications/monitoring--assessment/assessment/EPA\\_FIAR\\_Guidelines.pdf](https://www.epa.ie/publications/monitoring--assessment/assessment/EPA_FIAR_Guidelines.pdf). NB the EIA screening exercise has not yet been completed for the Proposed Project. The EPA's Guidelines have been referenced here as best practice.

and a project website. The consultation opened on 31 August 2021 and remained open for twelve weeks, closing on 22 November 2021. EirGrid undertook engagement to promote the consultation amongst local stakeholders. This phase included:

- Four Community Forum meetings (members of the Community Forum include An Taisce Meath, Batterstown Village Enhancement Group, Clane Community Council, Kilcock Tidy Towns, Kildare Chamber of Commerce, Maynooth Community Council, Red Road Residents Association, Straffan Community Association, Twomilehouse Community Centre, and Twomilehouse Say No Action Group alongside elected representatives from Kildare County Council and Meath County Council);
- Onsite engagement with a Mobile Information Unit visiting nine towns and villages for one week: Batterstown, Kilcock, Maynooth, Straffan, Prosperous, Clane, Sallins, Naas, Two Mile House;
- Engagement (including meetings and/or written communications) with multiple stakeholders including:
  - Transport Infrastructure Ireland Kildare Meath Working Group,
  - Department of the Environment, Climate and Communications,
  - Local Authorities: Meath County Council, Kildare County Council,
  - Business stakeholders: Kildare Chamber, Meath Chamber, Enterprise Ireland, the Industrial Development Agency,
  - Public Participation Networks (PPNs): Kildare Partnership, Meath Partnership,
  - Elected representatives: including Teachtaí Dála from Meath East, Meath West, Kildare North and Kildare South, as well as Senators,
  - Kildare Councillors from Athy Municipal District, Kildare-Newbridge Municipal District, Celbridge-Leixlip Municipal District, Clane-Maynooth Municipal District, and Naas Municipal District,
  - Meath Councillors from Ashbourne Municipal District, Ratoath Municipal District, and Trim Municipal District,
  - Two Mile House Says No (battery objection group),
  - Maynooth Community Council;
- Two public webinars;
- A media campaign in regional press and radio, social media, a project website, and online consultation portal.

The public consultation process allowed members of the public to view the four options presented in Figure 2-4 and to view the route sections that were not progressed (see Figure 3-1). The public were invited to provide comments, including identifying any information they felt should be considered about each option. Three channels were provided for submission of responses to the consultation:

- Online: by using the consultation webform at [consult.eirgrid.ie](https://consult.eirgrid.ie), accessible via the EirGrid website,
- Email: by emailing the project's dedicated email address, [kildaremeath@eirgrid.com](mailto:kildaremeath@eirgrid.com), administered by the project team at EirGrid,
- Post: by sending in a hardcopy response to the address provided by EirGrid.

A total of 108 responses were received during the consultation period. Further details on the responses are provided in Section 3.3 of this report.



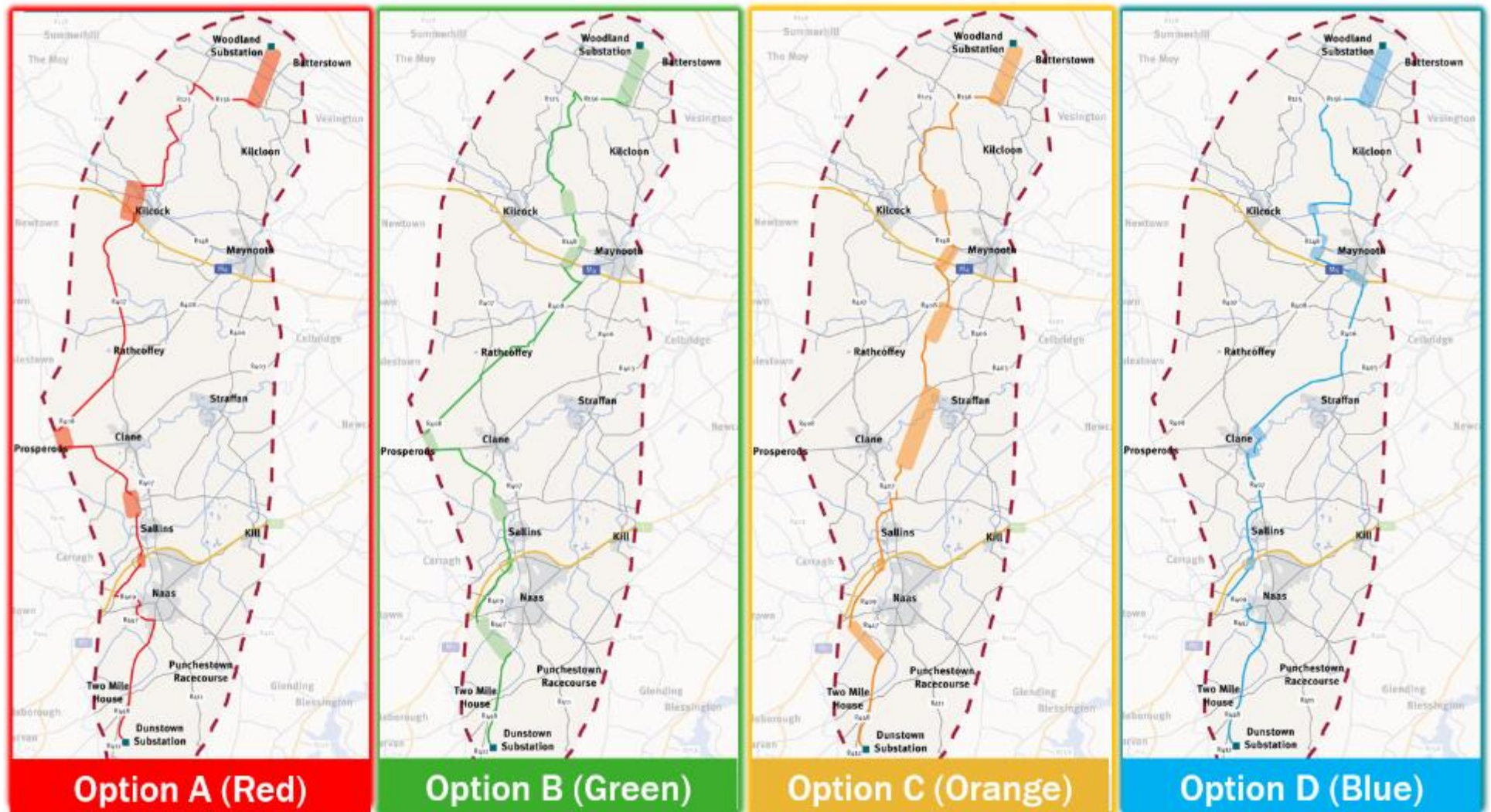


Figure 2-4: Options Shown in Public Consultation (2021)

## 2.3 Criteria Used for Comparison of Options

The Proposed Project has followed EirGrid's six-step approach to grid development as outlined in EirGrid's *'Have Your Say'* document. This approach facilitates engagement and consultation with stakeholders and the public which helps to explore route options fully and make more informed decisions. As part of the approach, a comprehensive and consistent multi criteria analysis is applied to decision making. The multi criteria analysis facilitates a balanced consideration of the following assessment criteria relating to the Proposed Project:

- Environment;
- Socio-Economic;
- Technical;
- Deliverability; and
- Economic.

Each of the proposed route options have been assessed across the constraints criteria detailed below based on the ranking approach presented below.

More significant/difficult/risk

Less Significant/difficult/risk



This risk scale is clarified by text, as follows:

- High: Dark Blue;
- Moderate-High: Blue;
- Moderate: Dark Green;
- Low-Moderate: Light Green; and
- Low: Cream.

### 2.3.1 Environment Criterion

The environmental risks and considerations associated with the proposed route options, are considered under the following environmental assessment topics:

- Biodiversity (Flora and Fauna);
- Soils and Water;
- Planning Policy and Land Use;
- Landscape; and
- Archaeology, Architectural Heritage, and Cultural Heritage.

The assessment approach undertaken by each environmental assessment topic is outlined below with the detail on each individual option assessment outlined within Chapters 4 to 7. The environmental assessment topics use a mixture of qualitative and quantitative assessment to assign the overall score (e.g. low, moderate, high, etc.) to the assessment topic under consideration.

### 2.3.1.1 Biodiversity (Flora and Fauna)

The following aspects were considered in the assessment of the four route options in terms of biodiversity (flora and fauna):

- **Distance and connectivity to European and Ramsar sites** – the assessment looked at the proximity and hydraulic connection from the proposed route options to both SACs and SPAs in addition to any Ramsar sites. This allowed an understanding of potential pollution pathways and /or impact to Qualifying Interest (QI) species including potential impacts to foraging bird species from each route option;
- **Distance and connectivity to nationally important sites** - as above in the context of national sites;
- **Watercourse crossings, aquatic species and Water Framework Directive (WFD) status** - The assessment looked at the number and potential watercourse crossings, proposed crossing technique in addition to the aquatic species of interest and the current WFD waterbody status i.e. good, poor etc.; and
- **Known or presumed of species and/or habitats of conservation interest** - the assessment considered findings from desk based review in addition to initial site visits to identify species/habitats of conservation interest potential impacted by each of the proposed route options.

The next stage of the assessment (i.e. Step 5) will consider the potential for significant impacts on European sites in the context of Article 6(3) of the Habitats Directive and the need for measures to mitigate against significant impacts will be determined. A detailed ecological and hydrogeological/hydro morphological assessment would be required to ensure that river crossings do not alter the physical, chemical or biological standards necessary for the achievement of favourable conservation status of European site features and avoidance of impacts to protected species as set out in EirGrid's Ecology Guidelines for Electricity Transmission Projects (EirGrid 2020). Ecological constraints are shown in Appendix A.1.

### 2.3.1.2 Soils and Water

The following aspects were considered in the assessment of the four route options in terms of soils and water:

- **Geology, Soils and Economic deposits** - a review of desk based data to understand the geological and soils assets potentially impacted by the proposed route options. This aspect also considered potential for the proposed route options to encounter karst features and known mines;
- **Groundwater** - a review of desk based data to understand aquifer importance, groundwater vulnerability, WFD status, public or private water supplies and any groundwater dependent water bodies potentially effected by each route option;
- **Surface Water**- closely connected to the biodiversity criteria this assessment looked at the number and potential watercourse crossings, proposed crossing technique in addition to the current WFD waterbody status (i.e. good, poor etc.) and proximity to designated sites. Sensitivities are determined based upon their WFD status and proximity to a designated habitat – in this case, the Rye Water Valley/Cartron SAC.
  - Likely crossing techniques are determined as follows:
    - Open Cut (OC): shallow crossings (i.e. streams, very small/shallow canals, roadside water) can be open cut using temporary over-pumping to maintain water flow during installations;
    - Cable bridges/micro-tunnels: for anything (approximately) wider than 4m and deeper than 1m where Horizontal Directional Drilling (HDD) not adopted, alternative solutions like cable bridges/culverts/micro-tunnels are also considered;
    - HDD: When the crossing becomes consistent (i.e. a large and/or sensitive watercourse);
    - If the crossing is particularly impactful from a cable ratings prospective (i.e. very deep, very poor ground), and creating mini substations both sides of the river to double the



number of cables at the crossing for the HDD is not an option, then tunnelling is also considered.

- Potential impacts are identified by considering the sensitivity of the water body and the risk associated with the crossing technique employed;
- **Flood Risk** – The National Indicative Flood Mapping<sup>8</sup> was reviewed for each route option and the number of watercourse crossings were also taken into account.

### 2.3.1.3 Planning Policy and Land Use:

The following aspects were considered in the assessment of the four route options in terms of Planning Policy and Land Use:

- **Planning Policy and Legislation** - The Planning and Development Act 2000 (as amended) forms the foundation for planning in Ireland and covers a large range of planning-related issues, consolidating a wide range of different legislation into one place. There have been a number of amendments to the Act since 2000; collectively these are known as the 'Planning and Development Acts'. These Acts are underpinned and implemented by the Planning and Development Regulations 2001 (and amendments). Other National, Regional and Local Planning Policy relevant to the Study Area will also be taken into account to identify potential impacts at a national, regional and local level.
  - National and Regional Planning Policy set out high-level strategic objectives for shaping the future growth and development of Ireland. The Local Plans should align with these policies and plans.
  - County Development Plans and Local Area Plans detail development objectives and policies that influence the siting of projects at county and local level. These objectives and policies may relate to constraints such as land use zoning biodiversity, flood risk, cultural heritage, landscape designations and characterisations, protection corridors, amenity and existing and proposed residential land use.
- **Planning Applications (including other large infrastructure projects)** - A review of planning applications has been performed in order to gain insight into the future built environment which may have developed by the time construction commences on the Proposed Project. This includes all granted and live applications over the last five years within a 50m buffer of each route option.

### 2.3.1.4 Landscape

The following aspects were considered in the assessment of the four route options in terms of Landscape:

- **Landscape Character** - this aspect of the landscape criteria assessment looked at the existing Landscape Character Areas (LCAs) and their sensitivity to the Proposed Project in order to identify the potential magnitude and significance of any impact to these LCAs. These significance ratings were used to feed into the overall score for each route option in terms of landscape impacts.
- **Landscape elements** – a review of designated and non-designated highly sensitive landscape elements was undertaken in the context of proximity to each route option. Again, the sensitivity, magnitude and potential significance to these Landscape elements is defined in order to develop the overall score in term of landscape.

<sup>8</sup> [www.floodinfo.ie](http://www.floodinfo.ie)

### 2.3.1.5 Archaeology, Architectural Heritage, and Cultural Heritage.

The locations of the following aspects were considered in the assessment of the four route options in terms of archaeology, architectural heritage, and cultural heritage:

- Designated Archaeology:
  - National Monuments and Preservation Orders
  - Register of Historic Monuments (RHM)
  - Recorded Monuments
  - Sites on the Sites and Monuments Record (SMR)
- Designated Architectural Heritage
  - Record of Protected Structures
  - Architectural Conservation Areas (ACA)
  - National Inventory of Architectural Heritage (NIAH)
  - Historic Gardens and Designed Landscapes (GDL)
- Cultural Heritage Assets

In order to identify and quantify the constraints above that may be impacted by the proposed route options, including indirect impacts, a Study Area of 100m was established around the route option under consideration. A 100m Study Area is considered sufficient to capture impacts given any direct impacts would largely result from the excavation for the cable trench, joint boxes, and temporary launch and reception pits for directional drilling, and be focussed on the alignment of the route option. Any indirect impacts are anticipated to be temporary (lasting the duration of construction in each location), localised along the wayleave corridor and are not anticipated beyond 100m.

Baseline conditions were established through desk-based research, including a review of the following sources:

- The archaeological and architectural features identified as part of the Environmental Constraints Report;
- Aerial imagery, including Google, OSi Digital Globe, and EirGrid aerial photography;
- Historic mapping available online, comprising:
  - The Down Survey of Ireland<sup>9</sup>;
  - Noble and Keenan’s map of Kildare (1752)<sup>10</sup>;
  - Larkin’s map of Meath (1812)<sup>11</sup>; and
  - Historic Ordnance Survey mapping (Ordnance Survey 6”, 1837 – 1842 and Ordnance Survey 25”, 1888-1913);
- Placename information available online<sup>12</sup>;
- The National Folklore Collection via the UCD digital library available online<sup>13</sup>; and
- Topographical files of the National Museum of Ireland through the online National Museum of Ireland: Finds Database (up to 2010) available online<sup>14</sup>.

<sup>9</sup> <http://downsurvey.tcd.ie/index.html> [Accessed 05.11.21].

<sup>10</sup> <https://www.logainm.ie/Eolas/Data/Brainse/logainm.ie-map-j-noble-and-j-keen-an-1752-grand-jury-kildare-south.jpg> and [logainm.ie-map-j-noble-and-j-keen-an-1752-grand-jury-kildare-north.jpg \(4800x3501\)](https://www.logainm.ie/Eolas/Data/Brainse/logainm.ie-map-j-noble-and-j-keen-an-1752-grand-jury-kildare-north.jpg) [Accessed 09.11.21].

<sup>11</sup> <https://www.logainm.ie/Eolas/Data/Brainse/logainm.ie-map-william-larkin-1812-grand-jury-meath-sheet-06.jpg> [Accessed 09.11.21].

<sup>12</sup> [www.loganim.ie](http://www.loganim.ie)

<sup>13</sup> <https://digital.ucd.ie/>

<sup>14</sup> <http://heritagemaps.ie/>

A unique reference number was assigned to each constraint. Archaeological constraints are prefixed with 'AY' and architectural heritage constraints are prefixed with 'AH'. Demesne lands are prefixed with 'DL' and undesignated cultural heritage sites are prefixed with 'CH'. Archaeological, architectural heritage and cultural heritage constraints are identified in the sections below and are also shown in Appendix B.1. Supporting baseline information for the archaeological, architectural heritage and cultural heritage constraints identified is provided in Appendix B.1.

The assessment was undertaken based on the guidance provided in EirGrid's '*Cultural Heritage Guidelines for Electricity Transmission Projects*'<sup>15</sup>. The assessment looked at the potential for direct and indirect impacts on the identified feature within the 100m Study Area in order to ascertain the overall score for the archaeology, architectural heritage, and cultural heritage criteria. Full details for the archaeology, architectural heritage and cultural heritage constraints identified are provided in Appendix B.1.

### 2.3.2 Socio-Economic Criterion

The socio-economic risks and considerations associated with the four route options were considered under the following assessment topics. These assessment topics are consistent with the assessment topics considered within the Step 3 Strategic Social Impact Assessment Scoping Report (EirGrid 2020<sup>16</sup>) and the Step 3 Environmental Constraints Report (EirGrid 2020<sup>17</sup>). The assessment topics for the socio-economic criterion are:

- Traffic, Transport and Access;
- Noise, Vibration and Air Quality;
- Visual;
- Amenity;
- Health;
- Employment and Economy;
- Land-use (and Land Take);
- Agricultural (and Equine); and
- Utilities.

The assessment approach undertaken by each assessment topic is outlined below with the detail of the assessment of each individual route option outlined within Chapters 4 to 7 of this report. These assessment topics use a mixture of qualitative and quantitative assessment to assign the overall score (e.g. low, moderate, high, etc.) to the assessment topic under consideration.

Electromagnetic Fields (EMF) are an important consideration in any electrical transmission project. EirGrid's design standards require all underground cables to operate within existing public exposure guidelines from the International Commission on Non-Ionising Radiation Protection (ICNIRP) and as such there will be no effect from EMFs in terms of human health and interference to other electrical devices and systems. In this way, EMFs are not a differentiator between the cable options and are not assessed at this stage in the Proposed Project. They will be assessed at the next Step in the project.

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<sup>15</sup> EirGrid, 2015, *Cultural Heritage Guidelines for Electricity Transmission Projects*.

<sup>16</sup> EirGrid. 2020. Step 3 Strategic Social Impact Assessment Scoping Report. <https://www.eirgridgroup.com/site-files/library/EirGrid/Draft-Strategic-SIA-Scoping-Report-Kildare-Meath-Grid-Upgrade-Step-3.pdf>

<sup>17</sup> EirGrid. 2020. Environmental Constraints Report. <https://www.eirgridgroup.com/site-files/library/EirGrid/Environmental-Constraints-Report-Kildare-Meath-Grid-Upgrade-Step-3.pdf>

### 2.3.2.1 Traffic, Transport and Access

The following aspects were considered in the assessment of the four route options in terms of traffic and transport:

- **Road Network** – the road type, its length per type (km) and consideration of the available width along stretches of the corridor (e.g. hardshoulder, and/or cycleway, footway provision along the route).
- **Junction** - the number of key junctions potentially affected by the route option; and
- **Access** – the number of properties located along the route option that could be potentially affected in terms of access as a result of the route option.

Consideration of these aspects if construction works were undertaken along the route and the likely traffic management measures required to accommodate current traffic movements along the routes. The likely impact of these measures on traffic progression and journey time reliability has been used to inform the ranking scoring applied.

### 2.3.2.2 Noise, Vibration and Air Quality

The assessment of potential impacts of noise, vibration and air quality is based on the quantification of sensitive receptors close to the proposed route options within a number of distance bands from each of the proposed route options. These distance bands are up to 300m for noise and 350m for air quality. The noise assessment focused on potential impact as a result of “noisy” elements during construction and the air quality assessment focused on potential impacts as a result of dust during construction.

### 2.3.2.3 Visual

The visual assessment focused on the proximity of the route option to specific receptors such as scenic designations.

### 2.3.2.4 Amenity

‘Amenity’ is the term used to describe the overall pleasantness and the ‘feel’ of a community and the ability for people to enjoy the general character or quality of their surroundings.

The impact on amenity of the four route options is determined by considering the indirect (in-combination) impact of the following environmental effects:

- Air quality;
- Noise (and vibration);
- Visual; and
- Traffic and transport.

Where there is a combination of at least two direct environmental effects on a receptor or group of receptors, this is classified as an indirect (in-combination) impact on amenity. For example, where there are both visual and air quality impacts on a receptor or group of receptors, it would be concluded that these receptors(s) would be indirectly impacted by an in-combination amenity effect.

### 2.3.2.5 Health

Impacts on human health relate to the likely impacts stemming from the direct 'nuisance effects' of noise (and vibration), air quality, visual and traffic. These environmental effects could impact individuals as well as groups of individuals directly, or indirectly by way of inducing stress or fear. Examples of how such environmental effects can impact human health during construction are outlined below.

Dust and pollutant emissions from plant machinery or construction-related traffic, in the absence of mitigation measures, could lead to general annoyance as well as being detrimental to the respiratory health of individuals and communities in close proximity to construction activities.

Noise (and vibration) impacts that are considered to be excessively noisy and brought on by construction or operational activities can lead to impaired hearing, sleep disturbance, and general annoyance. There is also increasing evidence of a link to heart disease and hypertension (WHO, 2018)<sup>18</sup>.

Changes in the long-standing visual environment can also lead to distress and annoyance for people and communities. This distress and annoyance would not just be in respect to changes in visual amenity but also due to changes in the landscape itself and its use by people and communities as a recreational amenity / asset.

### 2.3.2.6 Employment and Economy

The potential impacts on employment and the economy as a result of the four route options are determined by professional judgement, informed by currently known project information (particularly in respect to likely workforce composition, the duration of construction, and the construction methodology more generally), statistical data and evidence of the current economic climate in Ireland from the Central Statistics Office (CSO) as well as past professional experience on infrastructure projects of a similar scale and nature.

### 2.3.2.7 Land-use (and Land Take)

The assessment of the potential impacts on land-use, associated with land-take resulting from the construction and operation of the as a result of the four route options, are informed by currently known project information relative to likely construction methodology and the operational nature and scale of the Proposed Project.

### 2.3.2.8 Agriculture (including Equine)

The following aspects were considered in the assessment of the four route options in terms of agricultural (and equine):

- **Agricultural Land** – the amount of agricultural land crossed by the option.
- **High sensitivity agricultural enterprises** – the number of enterprises such as equine, dairy and horticultural potential potentially affected by the option. Sensitivity of enterprises is determined mainly from the type of farm enterprise. The appraisal of sensitivity is subject to professional judgement and evaluation of other site specific factors such as the land quality and importance of the enterprise.

<sup>18</sup> [https://www.euro.who.int/\\_data/assets/pdf\\_file/0008/383921/noise-guidelines-eng.pdf](https://www.euro.who.int/_data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf)

**Table 2.1: Application of United Nations' Sustainable Development Goals on the Proposed Project**

Farm Enterprise Type	Sensitivity
Stud farm, Equestrian centre, horticultural enterprise, intensive agriculture (poultry & pigs)	High - Very High
Dairy farm, intensive equine enterprises	High
Non-dairy grazing livestock enterprises (including beef, sheep and non-intensive equine) and grass cropping enterprise	Medium
Tillage	Medium
Rough Grazing, Bog, Forestry, Woodland (where poor land quality restricts farming practices)	Low - Very low

### 2.3.2.9 Utilities

Utilities provide many different services that people, and communities rely upon. There are many different types of utility infrastructure, which may be situated overhead (such as other electricity or telephone lines) or underground (such as electricity cables, water services, sewers, gas, fibre optic cables).

The assessment of potential impacts on utilities is informed by desk-based research on the extent and nature of utilities likely present in the Study Area, currently known project information relative to likely construction methodology and best practice measures in respect to treatment of utility infrastructure during construction (and operation, as applicable).

### 2.3.3 Technical Criterion

The technical assessment included review of the proposed route options against the criteria laid out in EirGrid's Framework for Grid Development:

- **General Compliance with System Reliability, Security Standards** – EirGrid's reliability and security standards are defined in the Transmission System Security and Planning Standards and their Operation Security Standards;
- **Headroom and Ratings Impact** – This is the amount of additional capacity each route option offers that would be available for the future without requiring further upgrade;
- **Maintainability** – This considers the ease with which the route option can be serviced and maintained, for example how easy it is to access joint bays and link boxes;
- **Technology Operational Risk** – This criterion aims to capture the risk of operating different technologies on the network;
- **Average Reliability Rates** – This is the likelihood of the chosen cable technologies such as cables, joint bays, and bonding failing during operation; and
- **Repeatability** – Repeatability means whether the proposed technical solution can be readily repeated in the transmission network.

#### 2.3.3.1 Technical Delivery Solution

It should be noted that there will be no additional reactive compensation and additional Harmonic filtering on the network for all the proposed route options. The small percentage difference in the lengths of each route option does not trigger any substantial change for any of the required auxiliary equipment noted above.

The technical delivery solution presented below follows on from the Step 3 report, as well as technical discussions and meetings with EirGrid. A 400 kV 2500mm<sup>2</sup> Cu conductor, single conductor per phase, cable solution was chosen. This is subject to confirmation through further studies. Preliminary cable data was received, courtesy of NKT Cables, which is reported below in Figure 2-5 and Figure 2-6.





nkt document no. TDA 336 Rev. 2 / 13.03.2017  
1 x 2500Cu XLPE Al PE 400 kV

TECHNICAL SCHEDULE TS – 56  
Physical Characteristics

400 kV XLPE Land Cable – 2,500mm<sup>2</sup> Cu XLPE

Note: All dimensions to be filled in where applicable.

Item	Query	Unit	Reply
1	Conductor: (a) Material Grade (b) Type e.g. round, etc. (c) Design e.g. stranded, segmental, enamelled etc. (d) Nominal diameter (e) Cross-sectional area (f) Method of water blocking	mm mm <sup>2</sup>	copper round stranded, segmental 63 2500 swelling yarns and/or swelling tapes
2	Inner Semi-conducting Layer: (a) Material Grade (b) Nominal thickness (c) Minimum thickness	mm mm	XLPE 1.8 0.7
3	Insulation: (a) Material Grade (b) Nominal thickness (c) Minimum thickness (d) Quality of insulation ± 10%	mm mm	XLPE 26.2 23.6 ± 10%
4	Outer Semi-conducting Layer: (a) Material Grade (b) Thickness (c) Minimum thickness	mm mm	1.5 0.7
5	Nominal diameter over core screen Roundness of core : maximum ovality < 0.9mm	mm mm	123 max. 0.9
6	Radial thickness of insulation incl. semi-conducting layers (a) Nominal (b) Minimum	mm mm	29.5 25.0
7	Bedding Layer/Water Barrier (a) Material (b) Thickness (c) OD of bedding layer (d) Method of electrical connection between 4 and 8 to avoid discharges (e) Method of water blocking	mm mm	semiconducting and swellable tapes 2.5 120  semiconducting and swellable tapes semiconducting and swellable tapes
8	Metallic Sheath: (a) Material (b) Type, corrugated or smooth (c) Nominal thickness (d) Mean diameter (e) Cross-sectional area (f) Diameter over crest of corrugations (g) OD of sheath if not corrugated (h) Diameter and no. of extra copper wires required to ensure short circuit performance of cable meets Specification 18060 (if needed)	mm mm mm <sup>2</sup> mm mm	aluminium smooth 1.5 120 608 n. a. 131  n. a.
9	Outer HDPE/MDPE Sheath : (a) Material (b) Nominal thickness (c) Minimum thickness (d) Shore D hardness	mm mm	HD PE 5.0 4.15 appr. 56
10	(e) Shrinkage % Nominal diameter of completed cable (max overall diameter must be ±140mm) including thickness of conductive layer	mm	max. 3% 140
11	Conductive Outer Layer Extruded Layer Material Extruded Layer thickness Extruded Layer Surface resistivity Graphite Layer Surface Resistivity Coefficient of friction of cable based on sidewall force equal to (a) for graphite layer (b) for extruded outer conductive layer Coefficient of Friction based on 5000N/m sidewall force (a) for graphite layer (b) for extruded outer conductive layer	mm mm kOhm/m kOhm/m mm	graphite coating - - max. 16 kOhm/m (a): in PE tube: 0.2 (b): n.a. here in PE tube, greased 0.1... 0.2 (a): in PE tube: 0.2 (b): n.a. here in PE tube, greased 0.1... 0.2
12	(a) Normal length per drum (b) Maximum length per drum	m m	500 at drum 4.5 m diameter x 3.7 m width 260
13	(a) Normal gross weight of loaded drum (b) Maximum gross weight of loaded drum	kg kg	25000 260
14	Maximum drum dimensions width/height	m/m	3.7 / 4.3
15	Minimum radius of bend around which cable can be pulled (a) Laid Direct (b) In ducts (c) Cable placed in position with former (d) Cable placed in position without former	m m m m	3.6 3.6 2.1 3.6
16	Permissible pulling force allowed on conductors during installation	kN	125
17	Maximum permissible sidewall forces	kN	70

Figure 2-5: Typical High Voltage Cable Technical Schedule

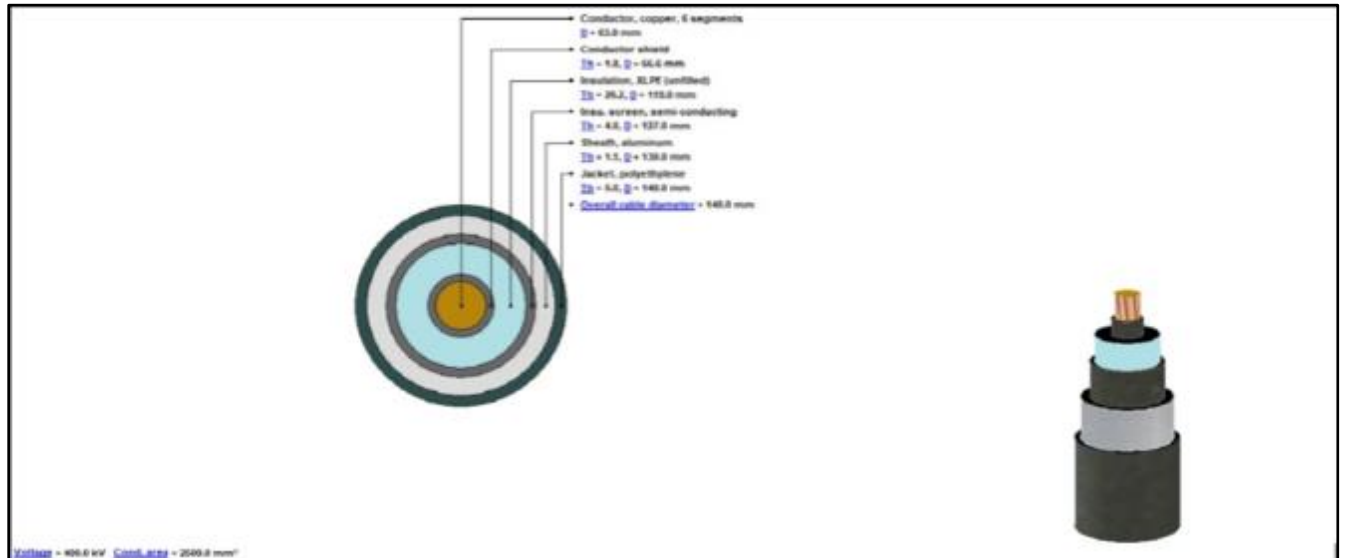
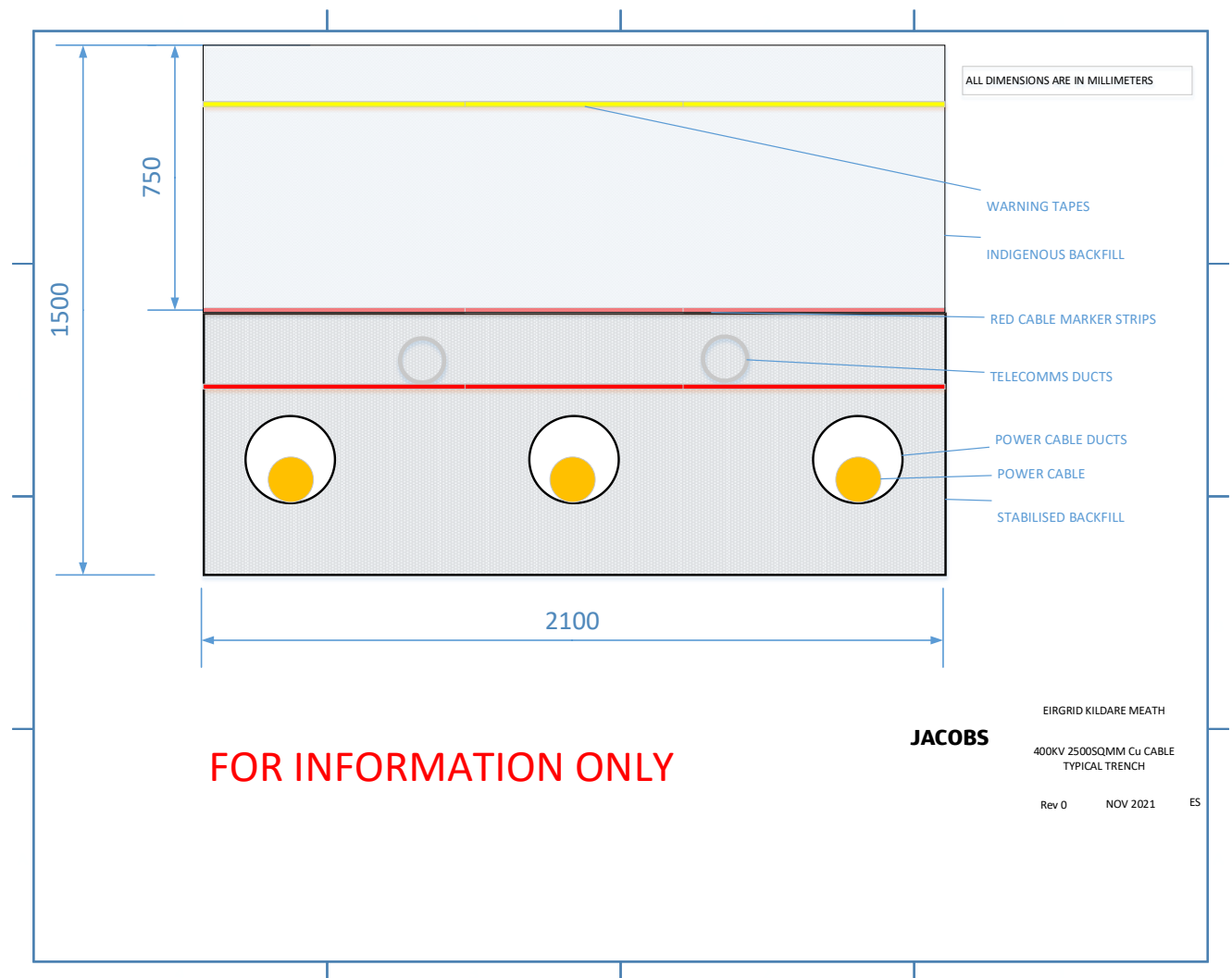


Figure 2-6: Cable model re-constructed in Cymcap

In order to understand the impact of the Proposed Project on the physical environment, Jacobs prepared a typical trench cross-section for reference (see Figure 2-7).



**Figure 2-7: Preliminary typical trench cross-section for 400 kV 2500sqmm Cu solution. Trench width 2100mm.**

This construction solution is expected to be utilised for the majority of the length of the Emerging Best Performing Option, where the circuit is installed in roads.

This solution carries the following advantages:

- A fully ducted route solution allows for decoupling of civil works from cable installation and testing works;
- Will minimise the duration of any required road closure along the route sections;
- Will facilitate future maintenance and repair works;
- Is compliant with EirGrid standards and best practices; and
- Allows for the delivery of transmission power as outlined in Table 2.2.

**Table 2.2: Target Transmissible Power (continuous ratings)**

	Winter	Summer
Transmissible Power/ Current*	1570MVA /2268A	1408MVA/ 2032A

(Correct at the time of writing – further changes in the cable rating may change this)

### 2.3.3.2 Technical Delivery Solution at crossing points

The delivery option described in Section 2.3.3.1, will be adopted for all options (Option A, Option B, Option C, and Option D) for cable installation in road like conditions.

Due to the presence of numerous and different obstacles along each of the proposed route options, a number of different crossing methodologies will need to be adopted for each obstacle outlined in Table 2.3.

**Table 2.3: Obstacle crossings solutions**

Obstacle description	Solution Description	Comment
Shallow crossings like Utilities, road drainage ducts, telecoms, medium pressure gas and other.	Typical trench as per Figure 2.8 with increased depth of ducts	Measures to improve rating, including thermal backfill material
Small streams/roadside water ditch/ shallow water crossings.	Typically open cut installation to avoid shallow obstacles with temporary water over-pumping to maintain flow during works (unless environmental risks drive HDD)	N/A
Larger waterways.	Cable bridges or cable culverts or micro tunnels	Solution will depend on ground conditions and impact to surrounding environment.
Large rivers/ wide canals/ motorways/ railways	Horizontal Directional Drills (HDD) or Auger Bores solutions	Solution will depend on ground conditions. Assume maximum depth of approximately 10m for these types of installation. Further spacing will be required to counteract the effects of depth on ratings.
Large rivers/canals/motorways/railways with very poor ground conditions.	Tunnel installation	Solution will depend on ground conditions

### 2.3.3.3 Impact on deliverable ratings caused by crossings

The crossings noted above that will necessitate deep HDD excavations, will have an impact on the overall circuit transmissible power. Along each of the proposed route options, the deepest crossing will act as a “ratings pinch point” for the route option and limit the overall transmissible power.

Preliminary calculations show the following:

- Solution A): A HDD, 10m Deep, with phase separation of 12m, will deliver 90% of target winter ratings as described in Table 2.1

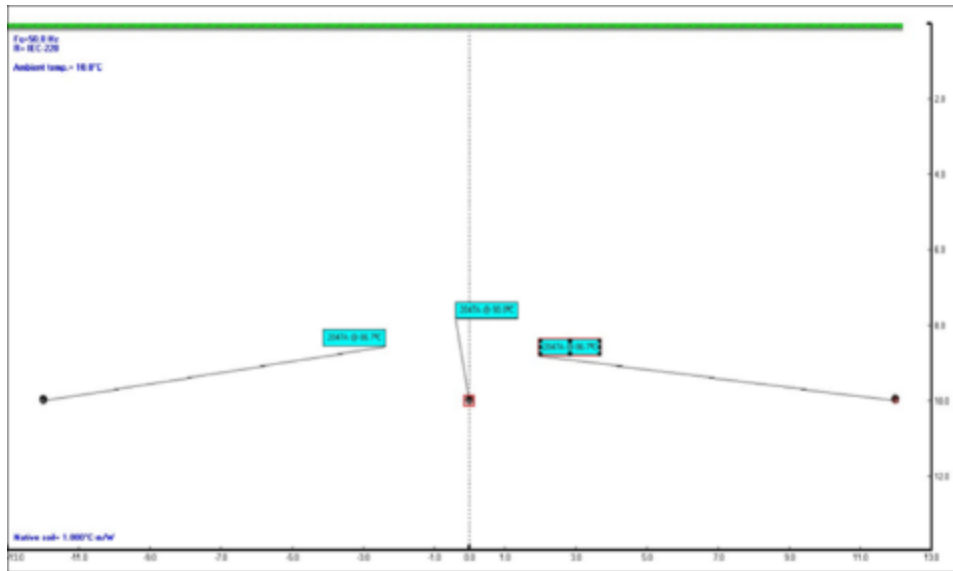


Figure 2-8: Calculation showing Solution A

- Solution B): A HDD, 10m Deep, with phase separation of 10m, will deliver 88% of target winter ratings as described in table 2.1

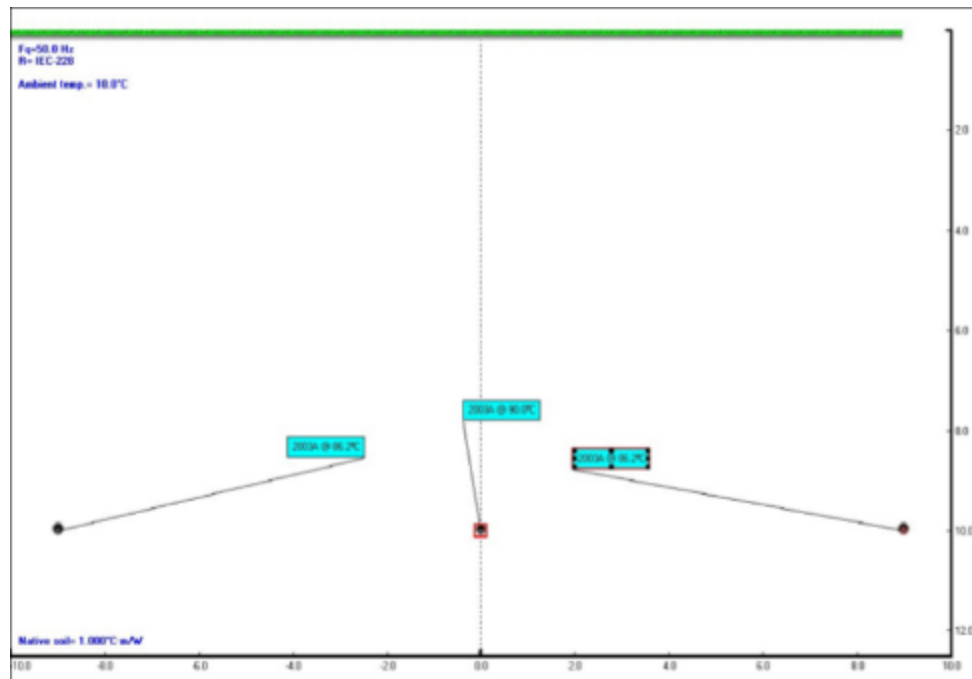


Figure 2-9: Calculation showing Solution B

There are a number of solutions to mitigate such effects:

- Utilise Bentonite in HDD ducts;
- Increase conductor size (2800, 3000mm<sup>2</sup>) at HDD crossing;
- Double number of phases at crossing; and
- Utilise a tunnel crossing solution.

### 2.3.4 Economic Criterion

Each route option is evaluated on the following:

- Kilometres of installed cable;
- Quantity of Minor and Major service crossings; and
- Number of Major Crossings (such as Horizontal Directional Drills).

The economic evaluation consisted in counting the occurrences of each crossing solution per section, for each of the four route options. The crossings were matched to the standard crossings highlighted in Table 2.3 above. Each of the crossing solutions above has an associated cost which is a multiplier of the standard trench cost. When added together, an indication of the relative cost for the selected route option is provided. A relative weight was also assigned to each route option based on its relative length over the shortest route. When assessing service crossings, focus has been placed on the differences between the reference installation rate (typical trench) and that of the crossing. This results in the key differences being the:

- Depth of excavation;
- Additional trench support;

- Support for the service being crossed;
- Method of excavation;
- Special equipment used; and
- Additional material used.

The method of excavation changes where either an existing gas main or electrical cable is being crossed. In these circumstances, hand digging is required. For water service crossings mechanical excavation methods with suitable supervision and controls are assumed to be used. Traffic management costs are included in the reference rate and consequently incur no additional cost for a service crossing.

### 2.3.5 Deliverability Criterion

Each route option shall be assessed with respect to deliverability performance on the basis of the following criteria:

- Design complexity: Each route section will be assessed in terms of the length of the route, obstacles encountered along the section, the number of utility crossings that will need to be made, the need for Horizontal Directional Drilling (HDD), requirements to micro-route to ensure a minimum duct bending radius of 20m, and the extent to which services have already been installed within the roadway;
- Traffic disturbance impact: Each route section will be assessed in terms of level of disruption including: the need for traffic management; the availability of alternate routes for diversion during installation works; and anticipated length of time the diversion or traffic management shall be in place;
- Dependence on other infrastructure projects: This will assess the extent to which the route may be impacted/may impact other infrastructure projects in the area;
- Permits and wayleaves: This will include consideration of the number of permits required for crossing other utilities, licenses, and easement/wayleaves; and
- Implementation Timelines: The installation timelines will be directly impacted by the deliverability criteria outlined above. Consideration will be given to the length of ducting that can be installed per day, as well as any seasonal and local constraints that may impact the implementation. Installation of the cable route will assume a standard 5-day working week.



### **3. Route Identification**

This chapter outlines the findings of the following:

- Route Section Assessment;
- End-to-End Assessment; and
- Public Consultation (August – November 2021).

#### **3.1 Route Section Assessment**

The process of how the route sections were designed and assessed is presented in Chapter 2 of this report. This section will describe the route sections.

##### **3.1.1 Description of Route Sections**

The route sections designed are presented in Figure 3-1 of this report and an overview is provided in Table 3.1. The route sections vary in length and location, which were determined taking into account the mapped constraints, the five assessment criteria, and the routing principles.

In-line with the routing principles, route sections have avoided going off-road, through private land and through agricultural land, where possible. The balancing with the other routing principles means that there are some route sections which do impact agricultural land. The impacts to agricultural land have been carefully considered and a balance has been sought between impacts to farming operations, the importance of field drains and hedgerows at the edges of field for their ecological value, and technical considerations.

None of the route sections directly impact private dwellings or gardens and none would require demolitions of dwellings.

The off-road sections within the options were shown as larger potential corridors. This was because consultations were required with affected landowners and further assessment was required. The larger potential corridors are included in the assessment that follows. However an indicative route within these corridors has been assumed in some cases. This is to allow an assessment to be undertaken at this Step of the Proposed Project. When the Emerging Best Performing Option is selected, further survey, design, consultation, and assessment will be completed to refine the potential corridors into a narrow route. This will be present at Step 4B and further refined at Step 5.

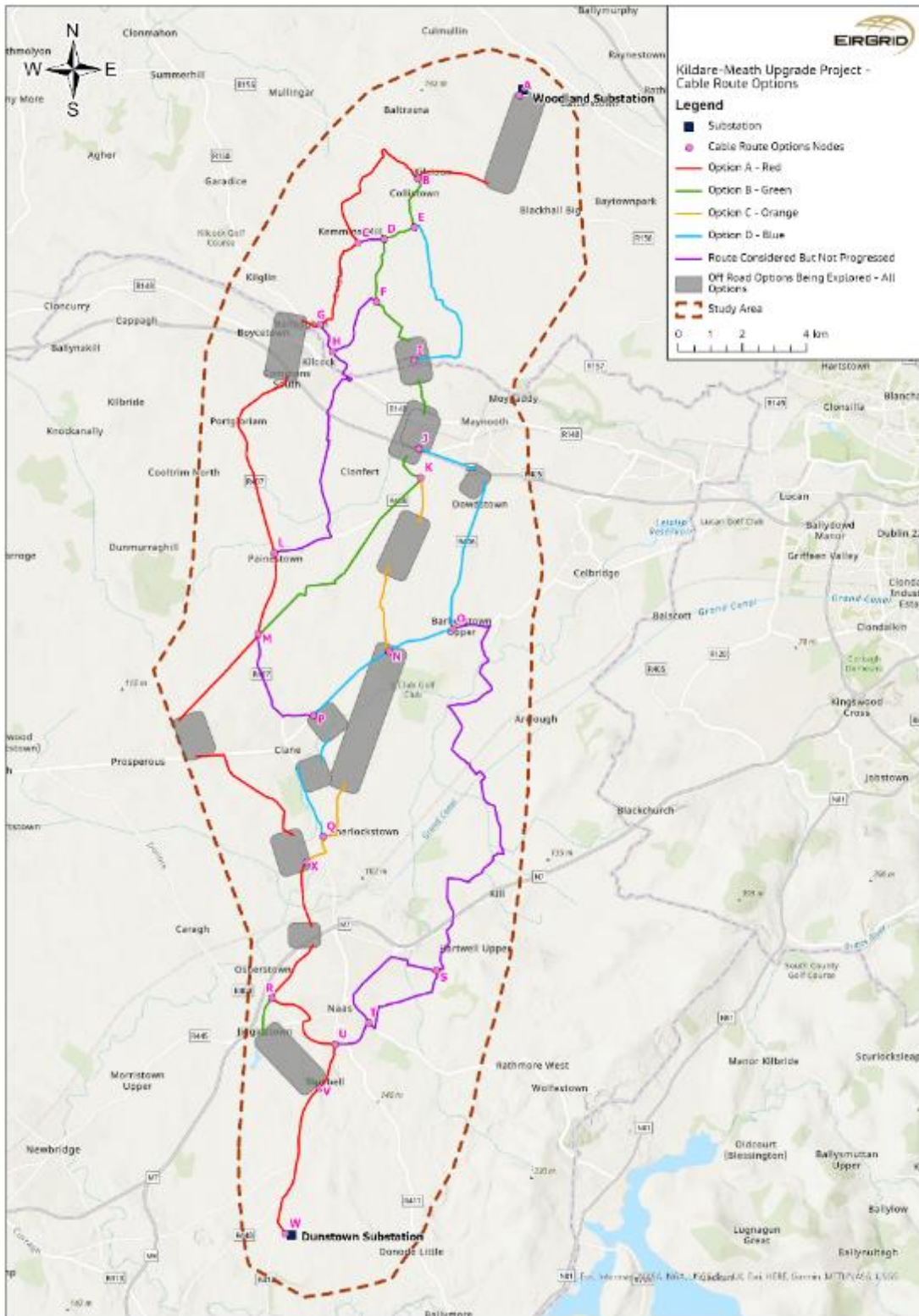


Figure 3-1: Route Sections

**Table 3.1: Overview of Route Sections**

Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
AB	6.1	Partial off-road section of 880m and the remainder on roads. Minor watercourse crossings on road and associated floodplains. No designated sites or cultural heritage sites adjacent. Off-road impacts to hedgerows and trees.	Ribbon development along L6207. Properties and businesses along R156 - including Barstown business park, restaurant (Hatchet Inn) and petrol station. No equine operations on off-road section. One small equine operation adjacent to L6207.	<p>Cable entry at Woodland Substation will have to be coordinated with other existing, ongoing, and future projects in design to minimise interaction.</p> <p>Technical issues are common to all lengths at this stage – each to be individually assessed. Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.</p>	No additional costs	<p>The section is common to all routes. The cable will need to maintain clearance from the existing Portan AC cables connecting the HVDC converter station to the AC Substation. Design will need to consider ground levels in the final 300m to the Substation approach. Narrow road (first sector only) and watercourse/drains crossings, various services to houses along road</p> <p>One overhead 110kV line. Water main 125mm (public and Mulhussey GWS) in western portion of R156. Regional road affected and accesses to ribbon development.</p>
BC	5.2	No off-road sections. Two crossings of the Jenkinstown Stream and associated floodplains. Larch Hill Demesne and Gardens is adjacent to the R125.	Some ribbon development along R125. Home Furniture Shop adjacent to the R125. Larch Hill Demesne and Gardens is adjacent to the R125.	<p>Technical issues are common to all lengths at this stage – each to be individually assessed.</p> <p>Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.</p>	No additional costs	<p>Road gets narrow in sections with trees both sides, 2 stream crossings of which one is via bridge. Local high point at Mullagh cross roads (Mullagh Hill 131m). Two crossings of 110kV and one 220kV. No water or sewer in road. Regional road affected.</p>
CG	3.2	No off-road sections. St Bride's Well and a designated Field system (an archaeological feature) directly adjacent to the R125. Several on road minor watercourse crossings - crossing on floodplain.	Some ribbon development along the R125. One equine operation adjacent to R125 (Calgath House). No other key socio receptors.	<p>Technical issues are common to all lengths at this stage – each to be individually assessed.</p> <p>Risk of various shallow crossings which may involve open cut installation.</p>	No additional costs	<p>A number of watercourse crossings one of which with a bridge. Narrow road at points with hedges and trees on both sides. No water or sewer network in R125. Regional road affected.</p>

Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
BE	1.7	No off-road section. Minor watercourse crossings on road - crossing one floodplain on road. No designated ecology and cultural heritage sites adjacent.	Dense residential ribbon development. St. Joseph's Primary School adjacent to road. One depot adjacent to the road. No off-road sections. No equine operations adjacent.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.	No additional costs	Drain crossings, narrow road. Services for the houses along road. Water mains (Mulhussey GWS) in full length of the road. Regional road affected and accesses to ribbon development, including primary school.
ED	1.0	No off-road section. Mulhussey Castle, historic church and cemetery set back from road.	Small number of houses adjacent to the road. No other key socio receptors.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve bentonite filled ducts to meet the required ratings.	No additional costs	short section passing by historical setting. One crossing of 220kV. No water or sewer network in R125. Regional road affected.
DC	0.8	No off-road section. Watercourse crossing on road. No designated ecology or cultural heritage sites adjacent.	Some ribbon development. No other key socio receptors.	Technical issues are common to all lengths at this stage	No additional costs	Narrow road, hedges both sides, expect services to houses. No utilities recorded. Local road affected.
DF	2.1	No off-road section. No key environmental constraints.	Ribbon development along road. Local feature known as the Dancing Tree was adjacent to southern end of length.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve bentonite filled ducts to meet the required ratings.	No additional costs	No. 2 drain crossings, narrow road in spots. Trees and hedges. One crossing of 110kV. No water or sewer network in the road. Local road affected and accesses to ribbon development.
FH	2.5	No off-road section. One on road crossing of tributary of the Rye Water and associated floodplain.	More roadside houses located on southern end of the length. Large equine operation (Dolanstown House) adjacent to the road.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may	Additional costs due to bridge crossing and substation	1 waterway crossing with bridge, route goes past electrical Substation with impressed voltage working and potential for underground cable crossing. Two 38kV crossings. Roadside Kilcock 38kV substation. 100mm water mains on last 400m of road. Local road affected and approach to Kilcock.

Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
			Breakdown recovery service located roadside.	involve both open cut installation and/or bentonite filled ducts to meet the required ratings.		
FI	2.5	Passes roadside historic church and cemetery. Approximately 630m off-road section through agricultural (equine) land - impacts to hedgerows and trees. Some minor watercourse crossings (on and off-road). One on road crossing of tributary of the Rye Water and associated floodplain.	Some ribbon development. Passes roadside adjacent Bryanstown Stud. Approximately 630m off-road section through agricultural (equine) land - Moyglare. Passes within 150m of Moyglare airstrip.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve bentonite filled ducts to meet the required ratings.	No additional costs	Potential for 2 drain crossings, route goes past a graveyard (ground issues) , the final section is through private property. One 220kV crossing. No water or sewerage network in road. Local roads affected.
GH	1.0	No off-road section. No key environmental constraints.	No off-road section. Dense ribbon development. No other key socio constraints	Technical issues are common to all lengths at this stage.	No additional costs	Narrow road, hedges and trees both sides. No water or sewerage network in road. Local road and access to ribbon development affected.
EI	6.4	No off-road section. Passes roadside church and graveyard. This is also the Meath and Kildare Col Diocesan Office. Two on road crossings of tributaries of the Rye Water and associated floodplains.	No off-road section (to be adjusted). Dense ribbon development along Moyglare Road (north and centre of length). Passes roadside equine operations (Barrockstown House, Moyglare Manor, and Moyglare Stud Farm). Passes roadside Lavins (large ice cream distributor), Sean Doyle Auctioneers, and John Lee Furniture. The entrance to Moyglare Manor (tours and self-catering location) is passed.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.  HDD or auger bore will be required for larger obstacles such as bridges.	Additional costs due to bridge crossing	1 bridge crossing, section shared watercourse along road, 1 watercourse crossing. Residential area along route expects services in road. Water mains (Mulhussey GWS) in (NS) Moyglare road. No services in (EW) Moyglare Road. Local roads with accesses to dense ribbon development affected.
HL	8.8	Two off-road section - one 240m and one 380m. The first off-road section crosses a tributary of the Rye Water. The second (380m) crosses the Royal Canal and its	Two off-road section - the first is 240m in length, the second is 380m in length, and the third is 320m in length.	Technical issues are common to all lengths at this stage – each to be individually assessed.	Additional costs due to motorway, canal and railway crossings	Hedges and trees along sections of the road, bridge crossing and a very deep drain ditch. Good locations available for launch reception pits for motorway crossing. Deviation required around railway and canal crossing where a lot of new developments are ongoing

Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
		<p>pNHA, the Sligo railway line, within the notification zone of a ringfort and agricultural land - impacts to hedgerows and trees. On road sections: Passes roadside church and graveyard at Barreen Crossroads. Crosses several on road watercourses included Baltracey River and River Lyreen, and associated floodplains.</p>	<p>The first off-road section (240m) crosses land zones for housing before tying into the road for the housing development (Millerstown). The second (380m) crosses the Royal Canal, the Sligo railway line, and agricultural land. The third (320m) crosses the M4 motorway and agricultural land. Dense ribbon development along the L5039 and L1010. Passes roadside Clonfert Maynooth Equestrian Centre and Rheindross Stud farm. Clonfert Maynooth Equestrian Centre is also a tourist attraction, as is at Laragh Demesne.</p>	<p>Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.</p> <p>HDD or auger bore will be required for larger obstacles such as deep ditches.</p>		<p>Water network (250mm) in road. Crossing of 220kV line, 38kV line, and 110kv line. Gas distribution line (medium pressure) located in new Millerstown estate and its access road. Crosses the proposed Water Supply Project at Barreen. Local roads affected with access to new housing development and dense ribbon development also affected.</p>
IJ	3.3	<p>Two off-road sections. Approximately 630m off-road section through equine operation (Moyglare Stud Farm). Off-road crossing of the Rye Water and its flood plain. Separate approximately 1.5km off-road section crossing agricultural land, River Lyreen and its floodplain, a designated enclosure and close to Laraghbryan church and cemetery, Royal Canal and pNHA, and the Sligo Railway line. Off-road impacts to hedgerows and trees. Several on road crossing of watercourses.</p>	<p>Passes some ribbon development. Approximately 630m off-road section through equine operation (Moyglare Stud Farm). Separate approximately 1.5km off-road section crossing agricultural land, Royal Canal, and the Sligo Railway line.</p>	<p>Technical issues are common to all lengths at this stage – each to be individually assessed.</p> <p>Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.</p> <p>2 separate HDD or auger bore crossing will be required for the larger obstacles such as canals, railways, and motorways.</p>	<p>Additional costs due to motorway, canal and railway crossings</p>	<p>One combined canal and railway and 1 motorway crossing with easy location for launch and reception pits. Gas distribution line (medium pressure) located in R148. Two crossings of 220kV and one 38kV crossing. No water or sewer network. Crosses the proposed DART+ West scheme. Local road affected.</p>



Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
JK	1.5	One off-road section at 240m in length, crossing the M4 motorway and agricultural land - impacts to hedgerows and trees. No key environmental constraints.	One off-road section at 240m in length, crossing the M4 motorway and agricultural land. Passes a roadside equine holding. Small number of houses adjacent. Robinson Farms (agri business) adjacent to L5042.	<p>Technical issues are common to all lengths at this stage – each to be individually assessed.</p> <p>Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.</p> <p>HDD or auger bore crossing will be required for the larger obstacles such as motorways.</p>	Additional due to motorway crossings	One motorway crossing with ample space for launch and reception pits. 300mm water main in L5042. Two crossings of 220kV. Local road affected.
JO	7.3	One off-road section at approximately 2.5km which crosses agricultural land and the M4 motorway - impacts to hedgerows and trees. Two off-road minor watercourses crossings and associated floodplain. Passes one roadside designated enclosure and a ringfort. It also passes through the notification zones of a ringfort close to the R406.	<p>One off-road section at approximately 2.5km which crosses agricultural land and the M4 motorway. The offline section is largely parallel to the M4 and is not zoned for use. There is the potential the M4 could be upgraded in this area in the future.</p> <p>On road section: Passes roadside TLC nursing home, Maynooth Business Park, and Straffan Antiques. Passes roadside two equine operations Iona Park Stud and Moneycooly Stud. Corbally Stud is set back from the R406 and is adjacent to the road.</p>	<p>Technical issues are common to all lengths at this stage – each to be individually assessed.</p> <p>Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.</p> <p>HDD or auger bore crossing will be required for the larger obstacles such as motorways.</p>	Additional due to motorway crossings	One motorway crossing. Noted on the survey that motorway level is lower than surrounding fields, with ample space for launch and reception pits. Three crossings of 110kV, two crossings of 220kV and three crossings of 38kV. Road passes roadside Maynooth substation. Gas distribution line (medium pressure) located in R406 (connection to TLC nursing home). Water main 100mm in R406. Regional road and access to Straffan and ribbon development affected.



Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
KN	6.7	<p>One off-road section of 2.4km that passes through agricultural land - impacts to hedgerows and trees. Off-road crossings of minor watercourses.</p> <p>On road section: Passes close to ringfort. Passes along road which is between two small native woodlands (partially severed due to 220kV line). On road crossings of watercourses including associated floodplain of one.</p>	<p>One off-road section of 2.4km that passes through agricultural land. This section avoids Cowanstown Stud. It also passes along the north boundary of a proposed 25ha solar farm which had planning permission at Smithstown.</p> <p>On road section: Passes the roadside Derrinstown Stud and a large dairy farm at Johninstown. Dense ribbon development on L5047 (Ovidstown)</p>	<p>Technical issues are common to all lengths at this stage – each to be individually assessed.</p> <p>Risk of various shallow crossings which will involve bentonite filled ducts to meet the required ratings.</p>	No additional costs	<p>Mostly off-road, and elsewhere on narrow roads with some very narrow pinch points with hedges both sides. Six crossings of 220kV lines and one crossing of a 110kV line. 125mm water main in L5044 and L5047 (Smithstown and Ovidstown). Crosses the proposed Water Supply Project at Smithstown. Local roads with dense ribbon development affected.</p>
KM	7.5	<p>No off-road sections. Length is on the R408. Passes roadside Donaghstown Church and Rathcoffey Church (both protected structures). On road crossing of River Lyreen (and its floodplain), one of its tributaries and other minor watercourses.</p>	<p>Passes roadside equine operations - Derrinstown Stud (both side of the road) and Cowanstown Stud. Some ribbon development along the R408 and more significant roadside properties in Rathcoffey and Moortown. Also passes roadside Farrington's Mill Restaurant, Cafe &amp; Bar, roadside animal feed store .</p>	<p>Technical issues are common to all lengths at this stage – each to be individually assessed.</p> <p>Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.</p>	No additional costs	<p>2 watercourse crossings. Three crossings of 220kV lines and one crossing of 110kV line. 100mm water main in R408. Crosses the proposed Water Supply Project at Raheen. Regional road affected and the settlements of Rathcoffey and Moortown affected.</p>
GL	9.1	<p>Off-road sections will impact on hedgerows and trees, including at the crossing of the Royal Canal and Royal Canal pNHA. On road crossing of the Rye Water, Baltracey River, and the tributary of the River Lyreen, and their associated floodplains.</p>	<p>The section travels along the R158, along the western edge of Kilcock town. It moves off-road to cross the Royal Canal and pNHA, and the Sligo railway. It travels off-road through agricultural land, which is zoned for</p>	<p>Technical issues are common to all lengths at this stage – each to be individually assessed.</p> <p>Risk of various shallow crossings which may involve both open cut installation and/or</p>	Additional costs due to the crossings	<p>1 bridge crossing, 1 combined canal+ road+ rail crossing with space for launch an reception pits, 2 x watercourse crossing an 1x motorway crossing. One crossing of 220kV and one crossing of 110kV. Crosses the proposed Water Supply Project at Baltracey. 150mm water main in R408 and around Kilcock. Gas distribution line (medium pressure) located in R148. Western edge of Kilcock and regional roads affected.</p>

Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
			development, and then crosses the M4 motorway. The crossing of the Canal and Railway would likely require a long HDD as there is a home fuel depot/sawmill at this location. The remainder of the length is on road on the R407. Passes Courtown equine operation, Mountpleasant Lodge nursing home, Damastown Stud (all roadside). Significant ribbon development south of Kilcock becoming less dense	bentonite filled ducts to meet the required ratings.  HDD crossing will be required for the larger obstacles such as bridge crossing and combined canal+ road+ rail crossing		
LM	2.6	No off-road section. On road crossing of Clonshanbo tributary. No other key ecological and cultural heritage constraints.	Passes roadside Terra Grove Stud, Painestown Stud, Rheindross Stud, and Boherhole equine operations. Ribbon development at Painestown Cross roads, and roadside petrol station, Precast Concrete business, and horse transport supplier.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve bentonite filled ducts to meet the required ratings.	No additional costs	One crossing of 220kV line. 400mm water main in R408. regional roads and ribbon development affected.
MP	3.8	On road crossing of the Gollmochy River and its floodplain. Passes the roadside Mainham Castle, church, graveyard and mausoleum (national monuments). Short off-road section in agricultural land (impacts to hedgerows and trees).	Passes roadside Redthorn Stud, Clane Golf course, and the entrances to Clane Business Park and Clongowes Wood College (boarding school). Dense ribbon development and passes through the northern suburbs of Clane to an off-road section (280m).	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.	No additional costs	Very narrow road with large services. Residential area. One small watercourse crossing. Gas distribution line (medium pressure) located in part of the R408. 400mm water main in R408 and small main (65cm) in suburban road. One crossing of 220kV line. Regional road, ribbon development, approach to Clane affected.

Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
			This off-road section is agricultural land but is zoned for development.			
MX	10.6	Two off-road sections of 1.3km and 800m. Both passes through agricultural land - impacts on hedgerows and trees. Two on road crossings and three off-road crossings of tributaries of the Liffey (including the Clane Stream and Gollmochy River). Southern end of the length is with the Liffey floodplain. Passes roadside Col church on L2002 (protected structure) and roadside tumulus (designated).	Passes roadside Redthorn Stud and wholesale plant nursery along R408. Dense ribbon development on R408, R403, and L2002. Two off-road sections of 1.3km and 800m. Both passes through agricultural land. Passes roadside Millicent airfield, Firmount House (undesignated events venue), and Millicent Estate Houses (protected structure) on L2002. Millicent Golf Club (community amenity and tourism venue) in the vicinity.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve bentonite filled ducts to meet the required ratings.	Some additional costs due to the numerous waterways	Three crossings 220kV lines and one crossing of 110kV line. Gas distribution line (medium pressure) located in part of the R403. Water mains along all of the on road sections. Regional road affected for part of length.
ON	2.2	No off-road section - all on R403. The road is adjacent to the Barberstown Castle and complex of designated sites (national monuments). On road crossing of tributary of the Liffey and its floodplain.	No off-road section - all on R403. Dense ribbon development on R403. roadside bar and restaurant and B&Bs, and Straffan Antiques and Design Centre.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve bentonite filled ducts to meet the required ratings.	No additional costs	Wide road, with residential services. 100mm water main and Gas distribution line (medium pressure) located in R403. Regional road and access to dense ribbon development affected.
NP	3.1	No off-road section - all on R403. On road crossings of minor watercourses.	No off-road section - all on R403. Ribbon development on R403. Passes roadside Abbeyfield Farm Equine and Activity Centre, car wash, used car dealer, and seasonal fruit stand.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to	No additional costs	1 watercourse crossing, . 100mm water main and Gas distribution line (medium pressure) located in R403. One crossing of 220kV line. Regional road and access to dense ribbon development affected.

Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
				meet the required ratings.		
PQ	4.9	Two off-road sections to the east of Clane (930m and 720m). The off-road section is agricultural but zoned in part for development. Off-road crossing of the Liffey and one its tributaries. The off-road sections are within its floodplain. Roadside castle (national monument) in Castlesize.	Two off-road sections to the east of Clane (930m and 720m). The off-road section is agricultural but zoned in part for development. Part of the off-road section (360m) passes through the northern section of the Blackhall Stud farm. Limited roadside properties. Roadside haulage and storage company off R407.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.	No additional costs	2 watercourse crossings, 200mm Water main and Gas distribution line (medium pressure) located in R407. Water main in also L20044. No OHL crossings. Regional road and residential accesses affected.
NQ	6.6	One 4.6km off-road section. Passes through agricultural land - impacts to hedgerows and trees. One off-road crossing of the Liffey and associated floodplain, and minor tributaries and other minor watercourses. Also, passes Irishtown House (protected structure). On road section passes the historic Bodenstown church and graveyard (which includes Wolfe Tone's grave).	One 4.6km off-road section. Passes through agricultural land and adjacent to Kilmorna Daars North equine operation. Passes the western edge of the K Club. The field to the west of the existing Bodenstown graveyard has planning permission for a new graveyard. On road section also passes the now closed Bodenstown Golf Course.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.	Some additional costs due to bridge crossing	1 watercourse crossing with existing bridge, route narrow at points with trees and hedges both sides. One 220kV crossing. Water mains in L2010, L6003, and L60031. Local roads affected.
QX	1.2	This length first follows the R407 and then largely follows the Sallins Bypass. On road crossing of the Liffey and its floodplain.	This length first follows the R407 and then largely follows the Sallins Bypass.	Technical issues are common to all lengths at this stage – each to be individually assessed.  Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.	No additional costs	Wide road, potential space in cycle tracks, large modern bridge. Ample space for launch reception pits. One 110kV crossing. Gas distribution line (medium pressure) and Water mains located in R407. Regional road and Sallins Bypass affected.

Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
				HDD crossing will be required for the larger obstacles such as bridge crossing river crossing.		
XR	5.0	The Sallins Bypass section has a crossing of the Liffey (and its floodplain), a crossing on the Grand Canal, its walkway and Grand Canal pNHA. This section also crosses the Kildare railway line and is adjacent to a number of cultural heritage sites. There is one minor off-road section through agricultural land to cross the M7 motorway. It then follows the Millennium Link Road (also called Western Distributor Road).	This length first follows the Sallins Bypass. There is one off-road section (400m) through agricultural land to cross the M7 motorway. It then follows the Millennium Link Road (also called Western Distributor Road). This road has a number of large business units adjacent, including a large Kerry Group manufacturing centre, motorway services and many planning applications for further development.	<p>Technical issues are common to all lengths at this stage – each to be individually assessed.</p> <p>Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.</p> <p>HDD crossing will be required for the larger obstacles such as bridge crossing, rail crossing and motorway crossing</p>	Additional costs due to crossings	1 bridge , 1 motorway (level below surroundings), 1 railway crossing. One 110kV crossing. Gas distribution line (medium pressure) located in the Millennium Link Road (also called Western Distributor Road). Water mains crossing under the Sallins Bypass in Osberstown, and in the Millennium Link Road. Regional road and Sallins Bypass affected.
OS	16.2	Three offline sections - 2.4km, 4.8km, and 790m. The first offline section (2.4km) comes after a short section on the R403. It is to avoid the village of Straffan and Lodge Park Demesne. Passes historic Whitechurch church, holy well, and graveyard. Crossing of the Kildare railway, Grand Canal and Grand Canal pNHA (off-road through agricultural land - impacts to hedgerows and trees). On road crossing of the Slane River (tributary of the Liffey). Crosses the M7 motorway. Off-road crossing of the Tobenavoher River and through agricultural	Three offline sections - 2.4km, 4.8km, and 790m. The first offline section (2.4km) comes after a short section on the R403. It is avoiding the village of Straffan but it passes through the land of Castle Dillion equine operation. Some ribbon development along the L2007, roadside Ballyhays Equine operation, Whitechurch equine operation, and Baronrath Stud. Crossing of the Kildare railway, Grand Canal (off-road	<p>Technical issues are common to all lengths at this stage.</p> <p>Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.</p> <p>HDD crossing will be required for the larger obstacles such as river/canal crossing, rail crossing and motorway crossing.</p>	Additional costs due to crossings and long sector	1 river, 1 canal , 1 waterway crossing, 1 railway, 1 motorway (ample space for launch and reception pits) crossings. Route crosses woodland around Johnstown. New housing developments along route . Two crossings of the proposed Water Supply Project. Two crossings of 38kV, one 220kV, two 110kV, and runs beside a 38kV UGC at southern end of length. Crossing of Gas distribution line (medium pressure) in Johnstown local road at southern end, it is also present in R403 at northern end. Water mains in R403, two crossings of 900mm water main on first off-road section in L2007, crossing of 400mm on second off-road section, in M7 , and Johnstown local road. Regional and Local roads affected. Approach to Johnstown affected.

Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
		<p>land.</p> <p>Second offline section (4.8km) is through agricultural land (impacts to hedgerows and trees). Off-road crossing of the Painestown River.</p> <p>There is a short on road section before the length continues onto agricultural land, with an off-road crossing of a tributary of the Morell River.</p> <p>The length crosses a number of floodplains.</p>	<p>through agricultural land ). Crosses the M7 motorway. Off-road crossing through agricultural land.</p> <p>Second offline section (4.8km) is through agricultural land. Off-road crossing of the Painestown River. It passes the Goffs bloodstock sales complex and then passes behind a planning permission for a new hotel and the edge of the Palmerstown House Estate.</p> <p>There is a short on road section before the length continues onto agricultural land (third off-road section), passes to the rear of the Irish Equine Centre. The area is densely populated.</p>			
ST North	4.3	<p>One off section (1.6km) which runs parallel to and crosses tributaries of the Morell River and associated floodplain. This off-road section is through agricultural land - impacts to hedgerows and treelines. Passes roadside Maudlins Cemetery (designated) and a modern graveyard. On road crossing of a tributary of the Liffey and its associated floodplain.</p>	<p>Off-road Section : north of the Naas Racecourse via Naas Industrial Estate. On Road Section : R410 and R445 . These roads are very densely developed and the R445 is the main road into Naas from Dublin. The route passes Maudlins Industrial Estate (includes a cinema), a GP surgery, An Post sorting depot, and other community amenities.</p>	<p>Technical issues are common to all lengths at this stage – each to be individually assessed.</p> <p>Risk of various shallow crossings which may involve bentonite filled ducts to meet the required ratings.</p>	<p>Additional costs due to services diversions</p>	<p>Narrow pass as length passes by Naas Industrial Estate . Wide road but expect all services and heavy traffic. Water mains and Gas distribution line (medium pressure) in R445. One crossing of 38kV line. Regional roads and Naas town affected.</p>

Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
ST South	3.4	One off-road Section (700m) through agricultural land - impacts to hedgerows and trees. Two on road crossing of tributaries of the Morell River and one off-road crossing, also crossing their floodplains.	Passes western boundary of Equine facility (Forenaghts Little). Dense ribbon development along L6035 and L6037. Off-road Section : traverses south western boundary of Naas Racecourse and through an area zoned for development.	Technical issues are common to all lengths at this stage  Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.	Some additional costs due to watercourses	Two watercourse crossings, narrow road at points with hedges and trees both sides. 100mm water mains in local roads. One crossing of 38kV line. Regional and local roads affected.
TU	1.4	On Road Section: Eastern side of Ring road (R447). Two on road crossings of tributaries of the Morell River and associated floodplain.	Densely developed area with roadside amenities, including primary school, church, and shops.	Technical issues are common to all lengths at this stage.  Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.	No additional costs	Gas distribution line (medium pressure) and water mains in the R447. Regional road affected. This section of route would be the closest section to Naas General Hospital and A&E. This road would be the main route to the hospital.
UV	1.5	On road section (R448): no designated sites adjacent.	On road section built up area with existing housing estates on west and eastern of the length. Passes two roadside primary schools and the entrance to Piper's Hill College. Existing Equine facility at Bluebell.	Technical issues are common to all lengths at this stage.  Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.	Some additional costs due to cable crossing	38kV cable crossing and nearby substation (expect impressed voltages) wide road with expected services. Gas distribution line (medium pressure) and water main in the R448. Regional road with roadside developments affected.
RU	3.1	On Road Section: traverses the Grand canal (pNHA), a tributary of the Liffey and its floodplain. Western side of Ring road. Jigginstown Castle to the west of the route.	On road section : via the Naas South Ring road (R447). Densely developed with housing on both sides of the road. Passes the entrance to Naas Sports Centre, supermarket , building suppliers, and children's charity.	Technical issues are common to all lengths at this stage.  Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to	Some additional costs due to canal crossing	1 canal crossing with available locations to launch and reception pits. Wide road with expected services. Water main along full length and Gas distribution line (medium pressure) along most of the length. Regional road with roadside developments affected.



Route Section	Approx. Length (m)	Environmental	Socio - Economic	Technical	Economic	Deliverability
				<p>meet the required ratings.</p> <p>HDD crossing will be required for the larger obstacles such as river/canal crossing.</p>		
RV	4.0	<p>One off-road Section (2.2km). Traverses the Grand Canal pNHA and through agricultural land (impact to hedgerows and trees). One on road crossing of a tributary of the Liffey and its floodplain.</p>	<p>One off-road Section (2.2km). Traverses the Grand Canal, through agricultural land, through the north eastern edge of Rathasker Stud Farm, and adjacent to Bluebell equine operation. On road section is on the Millennium Link Road, passes business parks and passes through the car park of a supermarket. Southern end is on L6066 passing between two houses.</p>	<p>Technical issues are common to all lengths at this stage.</p> <p>Risk of various shallow crossings which may involve both open cut installation and/or bentonite filled ducts to meet the required ratings.</p> <p>HDD crossing will be required for the larger obstacles such as river/canal crossing.</p>	<p>Some additional costs due to canal crossing</p>	<p>1 canal crossing. Route levels change at transition from on road to off-road. Crossing of Gas distribution line (medium pressure) at R445. Water main in Millennium Link Road. One crossing of 38KV line. Regional road affected.</p>
VW	4.9	<p>No off-road section. Entrance road to Dunstown substation passes through cluster of cultural heritage sites - likely previously resolved with construction of road. The R412 passes within 100m of Harristown Common - an important natural grassland habitat.</p>	<p>No off-road section. Ribbon development along R445 and R412, including roadside primary school. Passes a number of roadside Equine facilities.</p>	<p>Technical issues are common to all lengths at this stage.</p> <p>Cable entry at Dunstown Substation will have to be coordinated with other existing, ongoing, and future projects in design to minimise interaction.</p>	<p>No additional costs</p>	<p>Final approach to Dunstown SS, common to all routes. Ongoing ESB works in June 2021 along main road. Two crossing of 220kV line. 500mm water main in and runs adjacent to R448 and R412. Regional roads affected.</p>

### 3.1.2 Assessment of Route Sections

The route sections assessment, completed in-line with the methodology in Chapter 2, is summarised in Table 3.2.

**Table 3.2: Route Sections Assessment**

Route Sections	Assessment Criteria				
	Environmental	Socio - Economic	Technical	Economic	Deliverability
AB	Green	Green	Green	Yellow	Yellow
BC	Yellow	Green	Green	Yellow	Green
CG	Yellow	Green	Green	Yellow	Green
BE	Yellow	Green	Green	Yellow	Green
ED	Green	Yellow	Green	Yellow	Green
DC	Yellow	Green	Green	Yellow	Green
DF	Yellow	Green	Green	Yellow	Green
FH	Yellow	Green	Green	Green	Green
FI	Green	Blue	Green	Yellow	Green
GH	Yellow	Green	Green	Yellow	Green
EI	Yellow	Green	Green	Green	Green
HL	Green	Dark Blue	Green	Blue	Green
IJ	Green	Blue	Yellow	Blue	Yellow
JK	Green	Green	Green	Green	Green
JO	Green	Green	Yellow	Green	Yellow
KN	Green	Blue	Green	Yellow	Green
KM	Yellow	Blue	Yellow	Yellow	Yellow
GL	Green	Blue	Green	Blue	Green
LM	Yellow	Yellow	Yellow	Yellow	Yellow
MP	Green	Blue	Green	Yellow	Green
MX	Green	Green	Green	Green	Green
ON	Yellow	Green	Yellow	Yellow	Yellow
NP	Yellow	Green	Yellow	Yellow	Yellow
PQ	Green	Green	Yellow	Yellow	Yellow
NQ	Green	Green	Green	Green	Green
QX	Yellow	Yellow	Yellow	Yellow	Yellow
XR	Green	Green	Green	Green	Green
OS	Green	Dark Blue	Green	Blue	Green
ST North	Green	Dark Blue	Green	Green	Green
ST South	Green	Blue	Green	Green	Green
TU	Yellow	Blue	Yellow	Yellow	Yellow
UV	Yellow	Green	Yellow	Green	Yellow
RU	Yellow	Green	Yellow	Green	Yellow
RV	Green	Green	Yellow	Green	Yellow
VW	Yellow	Green	Green	Yellow	Yellow

### 3.1.3 Route Sections Not Progressed

Following the route sections assessment, it was determined that several route sections should not be taken forward. These route sections are described in Table 3.3. Generally, the reasons were lower socio – economic assessment rankings as shown in Table 3.2. Additionally, there are route sections which were ranked highly by themselves, but they were not progressed. This was because they connected to other route sections with low assessment rankings and could not be connected to other route sections.

**Table 3.3: Route Sections Not Progressed**

Route Sections	Reason for Not Progressing
C-D	Located to the north of Kilcock, this short length scored favourably, however, in identifying end-to-end options, it was determined that this length was not required.
F-H	Located to the northeast of Kilcock, this length scored favourably by itself however, selecting this length meant a crossing to the east of Kilcock. See Route Section H-L below.
G-H	Located to the northeast of Kilcock, this length scored favourably by itself but had denser housing along the road. Selecting this length meant a crossing to the east of Kilcock. See Route Section H-L below.
H-L	The eastern crossing of Kilcock (Nodes H-L) scored poorly because of the impacts to housing and lands zoned for development, and an elongated crossing of the Royal Canal (pNHA) and railway. To the south of Kilcock, the affected roads have a denser housing settlement along them, a roadside equestrian centre, and demesne.
M-P	Located to the north of Clane, the length was not progressed due to the social impacts.  Passes roadside Redthorn Stud, Clane Golf course, and the entrances to Clane Business Park and Clongowes Wood College (boarding school). Passes dense housing development and through the northern suburbs of Clane to an off-road section (280m). This off-road section is agricultural land but is zoned for development.
O-S, S-T (North) S-T (South) T-U	The sections to the east of Straffan and Naas scored poorly because of social impacts.  O-S - Several long off-road sections - Crossing of Grand Canal, its walkway and pNHA, railway, and M7 - Close to bloodstock sales (Goffs) and proposed hotel site. - Dense housing in sections  S-T (North) - One off-road section - Passes through Naas town - very densely developed  S-T (South) - One off-road section - Densely developed  T-U - On road section - Passes through south edge of Naas, closest section to hospital (traffic disruption during construction) - Very densely developed

## 3.2 End-to-End Assessment

With the completion of the Route Section Assessment, the project team were able to add the route sections together to create End-to-End route options. These route options were the proposed four route options presented at the Public Consultation between August-November 2021.

The Public Consultation between August-November 2021 presented the proposed route options with highlighted off-road sections (wider potential corridors). These sections were presented in this way as consultation was required with the potentially affected landowners and as further survey, design, consultation, and assessment were required. Within those highlighted off-road sections, indicative routes were assumed. These assumptions allowed the project team to complete their assessment as assessing a much wider corridor would not have been feasible. The wider corridors are shown in the accompanying figures to reflect the further work required to optimise the route at the next step of the Proposed Project.

The result of this assessment is shown in Chapters 4 – 7 of this report. All of the proposed route options are subject to further design and changes as the Proposed Project continues to the next steps. This will be as a result of further surveys, through public consultation, or information from landowners and statutory bodies. This is normal for linear infrastructure projects as the design will be subject to further changes as the project team move to find the best overall option. The following sections describe the four proposed route options.

### 3.2.1 Option A (Red)

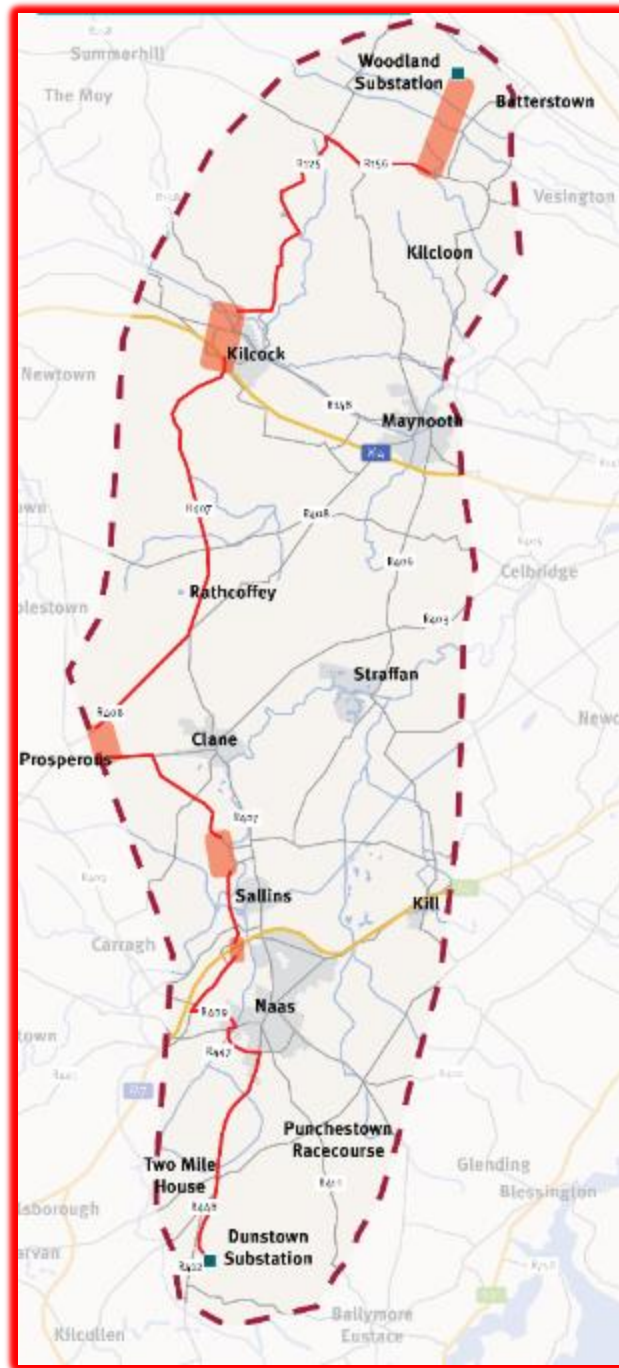


Figure 3-2: Option A (Red) Location map

Option A (Red) is the most westerly of the shortlisted cable route options and it is potentially the longest. All the shortlisted route options have a common section coming out of Woodland substation.

The common section out of Woodland substation travels to the townland of Jenkinstown. At the junction of the R156 and the L1012 (Mulhussey Road), Option A (Red) is proposed to travel along the R156 to the north west towards the Mullagh Cross Roads. It will then travel south along the R156, R125, and R158 towards Kilcock. It is proposed that Option A (Red) will pass to the west of the town of Kilcock and a potential corridor is shown on the project mapping. Crossings of the Rye Water, Royal Canal (a proposed NHA), Dublin-Sligo railway line, and M4 Motorway will be required. It is proposed that the cable will be drilled under these to avoid potential impacts.

To the south of Kilcock, Option A (Red) is proposed to travel to the south along the R407 towards Clane. To the north of Clane at the Boherhole Cross Roads, it is proposed to take Option A (Red) to the west to avoid Clane. It is one of the Proposed Project's routing principles to avoid towns and villages. Option A (Red) will travel along the R408 (the road to Prosperous). Close to the townland of The Cott, it is proposed to route the cable across agricultural land to the south east of the R408. This is required so that the route option can continue to travel to the south towards the Dunstown substation. A potential corridor is shown at this location on the project mapping. Option A (Red) will meet the R403, travelling along it until the Firmount Cross Roads, where it will continue south along the L2002. It will travel south to the new Sallins Bypass where a potential corridor is shown for a crossing of agricultural land. Along the Sallins Bypass, Option A (Red) will cross the River Liffey and Grand Canal (pNHA). A potential corridor is shown for the required crossing of the M7 Motorway.

Under the M7 Motorway, Option A (Red) will then travel along the Millennium Link Road (Western Distributor Road), travelling to the west around Naas. Option A (Red) will connect with the R409 and travel east towards Naas, passing the Naas Sports Centre and across the Grand Canal (a proposed NHA). The cable route then travels along the R445 and the R447 (South Ring Road). Option A (Red) connects with the R448 (Kilcullen Road) and travels south past Killashee. It meets the junction of R412 and then travels into the Dunstown substation.

### 3.2.2 Option B (Green)

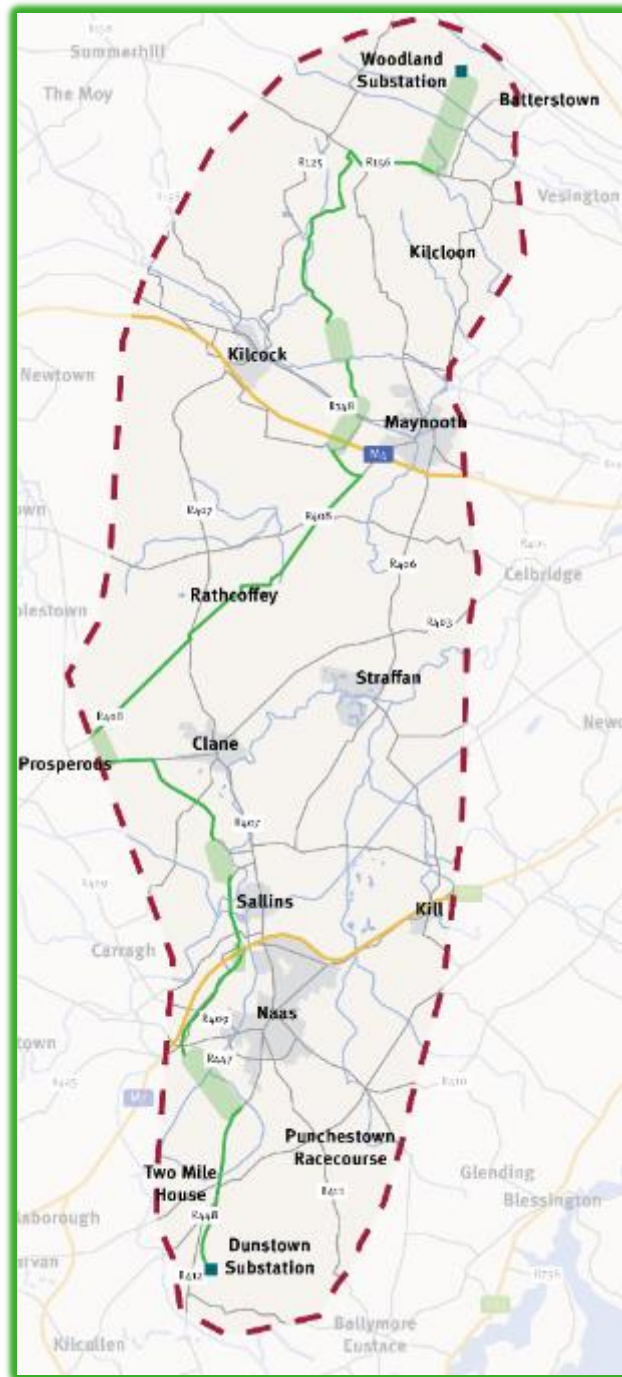


Figure 3-3: Option B (Green) Location Map



Option B (Green) has similar parts to Option A (Red) but differs in the section between the R156 to the north of Clane.

The common section out of Woodland substation travels to the townland of Jenkinstown. At the junction of the R156 and the L1012 (Mulhussey Road), Option B (Green) is proposed to travel south along the L1012 (Mulhussey Road). The route option passes the Mulhussey National School (St Josephs) and travels west and passes the roadside Mulhussey Castle and Cemetery toward Kiltens Gap Cross Roads. Here, the route option travels south towards Rodanstown and then south east to Bryanstown. Along this road a potential corridor is shown where Option B (Green) will travel south to cross the Rye Water and under agricultural land. Another potential corridor is shown where the cable will cross Royal Canal (pNHA), the River Lyreen, the Dublin-Sligo railway line, and M4 Motorway, avoiding Laraghbryan Cemetery. To the south of motorway, Option B (Green) connects with R408 where it will travel south west. Along this route, Option B (Green) will travel through the settlements of Rathcoffey and Moortown, then meeting with the R407 at the Boherhole Cross Roads.

It is proposed to take Option B (Green) to the west to avoid Clane. It is one of the Proposed Project's routing principles to avoid towns and villages. Option B (Green) will travel along the R408 (the road to Prosperous). Close to the townland of The Cott, it is proposed to route the cable across agricultural land to the south east of the R408. This is required so that the route option can continue to travel to the south towards the Dunstown substation. A potential corridor is shown at this location on the project mapping. Option B (Green) will meet the R403, travelling along it until the Firmount Cross Roads, where it will continue south along the L2002. It will travel south to the new Sallins Bypass where a potential corridor is shown for a crossing of agricultural land. Along the Sallins Bypass, Option B (Green) will cross the River Liffey and Grand Canal (pNHA). A potential corridor is shown for the required crossing of the M7 Motorway.

Under the M7 Motorway, Option B (Green) will then travel along the Millennium Link Road (Western Distributor Road), travelling to the west around Naas. To the south of the Southern Link Business Park, a potential corridor over agricultural land is shown. This section of Option B (Green) will cross the Grand Canal (pNHA). Option B (Green) connects with the R448 (Kilcullen Road) and travels south past Killashee. It meets the junction of R412 and then travels into the Dunstown substation.

### 3.2.3 Option C (Orange)

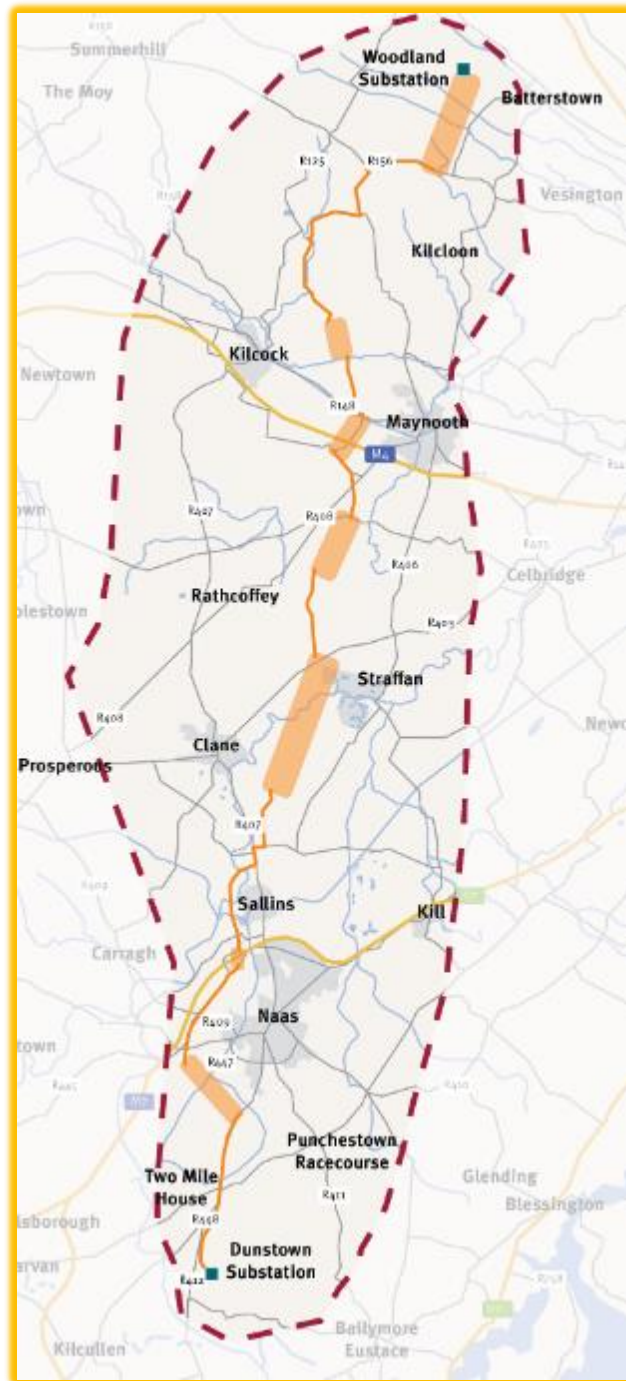


Figure 3-4: Option C (Orange) Location Map

Option C (Orange) is potentially the shortest of the four options, However, it will potentially affect much more agricultural land than the other shortlist sections.

The common section out of Woodland substation travels to the townland of Jenkinstown. At the junction of the R156 and the L1012 (Mulhussey Road), Option C (Orange) is proposed to travel south along the L1012 (Mulhussey Road). The route option passes the Mulhussey National School (St Josephs) and travels west and passes the roadside Mulhussey Castle and Cemetery toward Kiltens Gap Cross Roads. Here, the route option travels south towards Rodanstown and then south east to Bryanstown. A potential corridor is shown where Option C (Orange) will travel south to cross the Rye Water and under agricultural land. Another potential corridor is shown where the route option will cross Royal Canal (pNHA), the River Lyreen, the Dublin-Sligo railway line, and M4 Motorway, avoiding Laraghbryan Cemetery. To the south of motorway, Option C (Orange) crosses the R408 at Crinstown Cross Roads. It will travel south east on the L5042 until it meets the L5037 close to Maguire’s Wood. At this point, a potential corridor is shown to where the Option C (Orange) will cross under agricultural land. It will then connect with a local road in the townland of Smithtown, travelling south thorough Johninstown and Ovidstown, crossing the R403 to the north of the K Club.

Another potential corridor is shown travelling to the south until the townland of Blackhall. Here it travels under local roads, past the now closed Bodenstown Golf Club, and the roadside Bodenstown Cemetery, before connecting the R407. Option C (Orange) will travel along the R407 for a short length before connecting to the new Sallins Bypass. Along the Sallins Bypass, Option C (Orange) will cross the River Liffey twice and Grand Canal (pNHA). A potential corridor is shown for the required crossing of the M7 Motorway.

Under the M7 Motorway, Option C (Orange) will then travel along the Millennium Link Road (Western Distributor Road), travelling to the west around Naas. To the south of the Southern Link Business Park, a potential corridor over agricultural land is shown. This section of Option C (Orange) will cross the Grand Canal (pNHA). Option C (Orange) connects with the R448 (Kilcullen Road) and travels south past Killashee. It meets the junction of R412 and then travels into the Dunstown substation.

### 3.2.4 Option D (Blue)

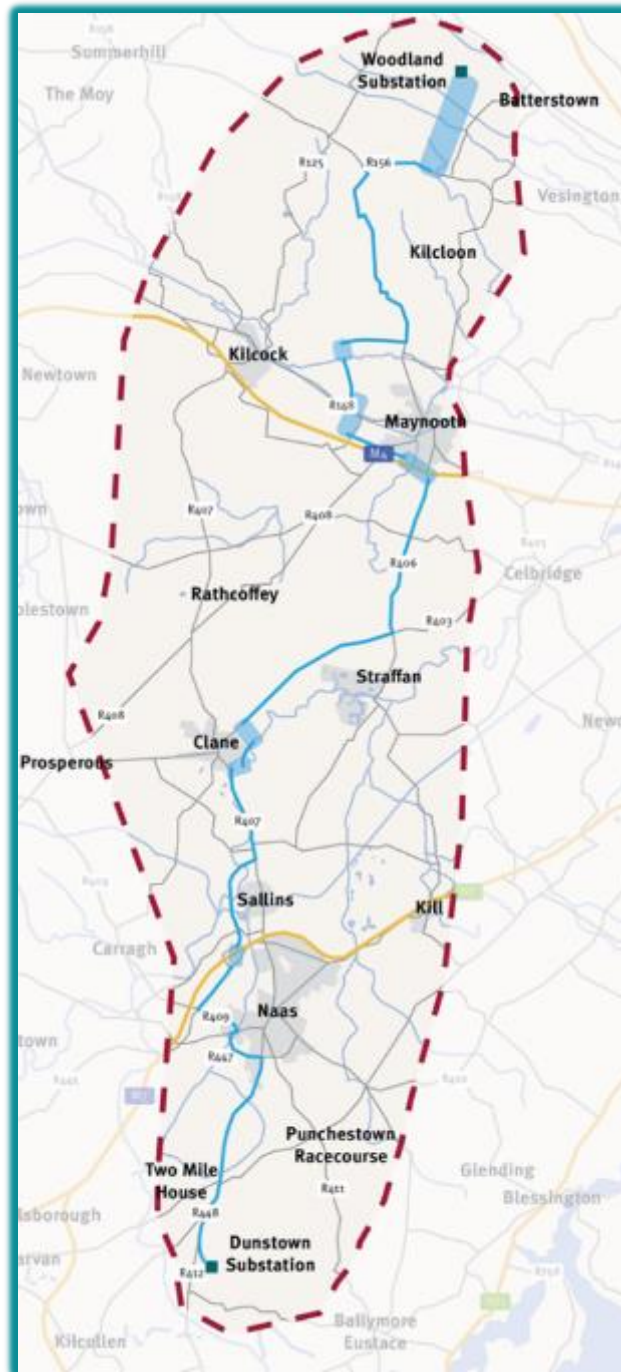


Figure 3-5: Option D (Blue) Location Map

Option D (Blue) potentially affects the least amount of agricultural land of the shortlist options.

The common section out of Woodland substation travels to the townland of Jenkinstown. At the junction of the R156 and the L1012 (Mulhussey Road), Option D (Blue) is proposed to travel south along the L1012 (Mulhussey Road). The route option passes the Mulhussey National School (St Josephs) and travels east and then south following the L1012 until the Moyglare Road. Here it will travel west to avoid Maynooth. Along this road a potential corridor is shown where Option D (Blue) will travel south to cross the Rye Water and under agricultural land. Another potential corridor is shown where the cable will cross Royal Canal (pNHA), the River Lyreen, and the Dublin-Sligo railway line, avoiding Laraghbryan Cemetery.

Option D (Blue) is proposed to travel parallel to the north of the M4 Motorway. It will then cross the motorway to the west of the Maynooth Junction (number 7) and connects to the R406. Option D (Blue) travels along this to the north of Straffan, where it meets the R403. This road will take the cable past Barberstown Castle towards Clane.

Option D (Blue) will travel to the east of Clane, crossing the River Liffey but avoiding the town. A potential corridor is shown in this area. The route connects the R407 to the south of Clane and then connects with the Sallins Bypass. Along the Sallins Bypass, Option D (Blue) will cross the River Liffey and Grand Canal (pNHA). A potential corridor is shown for the required crossing of the M7 Motorway.

Under the M7 Motorway, Option D (Blue) will then travel along the Millennium Link Road (Western Distributor Road), travelling to the west around Naas. Option D (Blue) will connect with the R409 and travel east towards Naas, passing the Naas Sports Centre and across the Grand Canal (pNHA). The cable route then travels along the R445 and the R447 (South Ring Road). Option D (Blue) connects with the R448 (Kilcullen Road) and travels south past Killashee. It meets the junction of R412 and then travels into the Dunstown substation.

### **3.3 Public Consultation (August – November 2021)**

The consultation process was promoted through Community Forum meetings, on-site engagement in the Proposed Project area, stakeholder engagement, public webinars, multi-channel advertisements and via the project website.

A total of 108 responses were received during public consultation. Consultation responses were received via an online forum (38), by email (nine) or by post (61). Public consultation has been an integral part of the Proposed Project, with each response being considered in the routing of the Proposed Project. A number of respondents expressed support for the overall Proposed Project, highlighting that the Proposed Project is needed, as it would bring economic benefits to the area by supporting job creation and by contributing to the development of a resilient energy network based on renewable energy sources. A number of respondents expressed support for the proposed route options generally following the road network, outlining that this would ensure ease of access for maintenance. A few of these responses outlined that the selection of roads should be determined by the amount of disruption on their use that the Proposed Project would cause and emphasised that motorways should be avoided.

Several respondents expressed concern about the general project. A small number of respondents outlined their concern about the potential for cable installation to impact on road safety and to exacerbate existing traffic issues in the area, particularly on the L5041 Local Road and the general road network around Maynooth, Prosperous and Clane. Some respondents raised concerns about the potential for project works to increase the frequency of accidents and the number of road hazards. One respondent expressed concern about the effect of the Proposed Project on its ability to maintain and improve roads and operational infrastructure, including embankments,

drainage, bridges, and road furniture. This respondent also highlights that cabling may need to be moved as roads are changed, moved, or upgraded in the future.

A small number of respondents voiced concerns about potential negative impacts on the integrity of historical and recreational assets in the local area, including the Royal Canal and Grand Canal. Others raised concerns about the potential for impacts on local people, the potential for impacts on the equine industry due to soil disturbance on stud land, including the movement of selenium from the sub-soil to the grass during cable installation and the potential for impacts to other developments in the area. However, a few respondents outlined their preference for the routing of the project through agricultural land instead of through more biodiverse areas and that the routing of cables through these lands would allow for easier access in future. Additional concerns raised by respondents included:

- The potential for health effects associated with locating power lines in close proximity to local people;
- The potential for environmental impacts, including impacts on wildlife arising from any disturbance to hedgerow and native woodland;
- The need to mitigate against environmental impacts and to ensure that Proposed Project minimises impacts on biodiversity, including by following the road network; and
- The possibility that underground cables would be expensive or difficult to access or maintain.

A number of respondents provided details of major events that EirGrid should be aware of prior to scheduling works for the Proposed Project, including details on sporting events (racing, fishing and hunting events) and cultural events such as Seachtain na Gaeilge, Féile na Sollán, parades at Bodenstown, Straffan Car Boot Sale, and national holidays such as St Patrick's Day and Christmas. In addition, some respondents offered more general suggestions for the scheduling of works, including requests to avoid scheduling works during summer, and on the other hand, requesting that term-time works should be avoided. The general theme of these scheduling requests centred around ensuring that EirGrid consider the needs of commuters and farmers in the area prior to scheduling project works. A small number of respondents offered other suggestions for the Proposed Project, including:

- Inviting members of the local community to determine the exact route the cabling would take through any towns or villages;
- Routing the cable along motorways, as motorways often take the shortest route from one place to another;
- Considering how to compensate people for any disruption they experience;
- Prioritising the route that would have the least financial impact on affected people;
- Avoiding the felling of mature trees and replacing any felled trees with newly planted ones; and
- Using large international suppliers with experience of completing similar projects.

Some respondents expressed support for the general consultation process, outlining that it was informative and that the consultation materials provided were helpful and appropriate. A similar number of respondents welcomed the opportunity to provide feedback on the Proposed Project.

A report has been prepared on the details on of the consultation process and it is available on the project website<sup>19</sup>.

<sup>19</sup> EirGrid. 2022. Consultation Summary Report. <https://www.eirgridgroup.com/the-grid/projects/capital-project-966/related-documents/>



## 4. Option A (Red)

This section outlines the assessment of Option A (Red) against the five assessment criteria – Environment; Socio-Economic; Technical; Deliverability and Economic; and their sub-topics.

### 4.1 Environment

As set out in Section 2.3.1, the 'Environment' criterion assessment topics under consideration to assist with determining the Emerging Best Performing Option are as follows:

- Biodiversity (Flora and Fauna);
- Soils and Water;
- Planning Policy and Land Use;
- Landscape; and
- Archaeology, Architectural Heritage, and Cultural Heritage.

#### 4.1.1 Biodiversity (Flora and Fauna)

##### 4.1.1.1 European Sites

Option A (Red) is not located within and does not adjoin any European site. The nearest European site is Ballynafagh Bog SAC located approximately 2km to the west of Option A (Red) and designated for bog habitats (Appendix A.1). There is no hydrological or ecological connection to this SAC. Although this route option involves the least off-road section length it does require a high number of river crossings (20) including crossing of watercourses with direct hydrological links to a complex of European sites within Dublin Bay including Rye Water/Carton SAC, South Dublin Bay and River Tolka Estuary SPA and South Dublin Bay SAC (see Appendix A.1). During construction and depending on crossing methodology there is the potential for impacts to aquatic habitats and species downstream through a pollution event. Habitats along the southern section of Option A (Red) are suitable to support foraging qualifying interests bird species from Poulaphouca Reservoir SPA (located 8km east of this option) namely greylag goose (*Anser anser*) and lesser-black backed gull (*Larus fuscus*), and therefore there is the potential for disturbance impacts to these species and temporary loss of habitat during construction if undertaken during the wintering bird season.

##### 4.1.1.2 National Sites

No NHA sites are located in proximity to this route option. The closest NHA site is Hodgestown Bog NHA located 4km west of Option A (Red). This route option also directly crosses the Royal Canal pNHA at Kilcock and the Grand Canal pNHA on two occasions at Sallins and Naas however a HDD method will be employed for these major crossings and, subject to a rigorous mitigation plan for HDD works, impacts to aquatic receptors can be minimised or avoided.

##### 4.1.1.3 Watercourses and Aquatic Species

This route option involves the crossing of several major rivers including the Rye Water, River Liffey, Lyreen River and tributaries of the River Tolka with varying WFD status' ranging from 'Good' to 'Poor'. There are potentially four major river crossings requiring HDD and eighteen smaller rivers and streams likely to employ other crossing methods such as open cut including the Rye Water River and its tributaries however this option is the greatest distance away from the Rye Water/Carton SAC. Open cut may not be possible across salmonid watercourse crossings. The majority of rivers crossed are classified as Moderate to Poor status under WFD. These rivers host an



abundance of aquatic species. The River Liffey supports Atlantic salmon (*Salmo salar*) and brown trout (*Salmo trutta*) whilst the Rye Water River is known to support minnow (*Phoxinus phoxinus*), European eel (*Anguilla anguilla*) and lamprey sp. and is also a spawning ground for trout and salmon. White-clawed crayfish (*Austropotamobius pallipes*) has been recorded at Leixlip within the Rye Water River. Otter (*Lutra lutra*) have been recorded in all the major watercourses. Where open cut is employed there is the potential for impacts to aquatic habitats and species through pollution, disturbance, loss/damage of fish spawning habitat and lamprey beds and spread of invasive species. Several rivers were noted to be suitable to support kingfisher (*Alcedo atthis*) with one bird recorded hunting along the River Liffey during field surveys.

#### 4.1.1.4 Recent Field Survey Data and Desk Based Review

An initial drive over comprising visual assessments and targeted spot checks at static locations of the accessible sections of the route option was undertaken on the 11<sup>th</sup>, 12<sup>th</sup> and 13<sup>th</sup> of October 2021 to scope wintering bird surveys. The dominant habitats recorded along Option A include hedgerows, treelines, agricultural grassland, tillage land (predominantly cereal production), amenity grassland and watercourses. Habitats along Option A (Red) have the potential to support breeding and wintering bird species including Annex I species and birds included in the amber and red list of Birds of Conservation Concern in Ireland (BoCCI). Snipe (*Gallinago gallinago*) which is red-listed in BoCCI and kingfisher (*Alcedo atthis*) which is an Annex I listed bird species within the EU Birds Directive was recorded during visit one of the wintering bird surveys in October 2021. Hen-harrier (*Circus cyaneus*) winter roost surveys commenced in October 2021 at Prosperous and Ballynafagh Bog SAC west of Option A (Red). No hen harrier was recorded during the surveys. Devil's bit scabious (*Succisa pratensis*), the food plant of the Annex II and IV listed marsh fritillary butterfly (*Euphydryas aurinia*), was recorded near Dunstown substation within Harristown Common.

A data request submitted to Birdwatch Ireland for Irish Wetland Bird Survey (I-WeBS) data for Poulaphouca Reservoir SPA and any incidental records available for Co. Kildare and Co. Meath were received in October 2021. The records returned for years 2016 – 2020 showed large numbers of greylag goose, mallard (*Anas platyrhynchos*) and teal (*Anas crecca*) with lower numbers of several other species including whooper swan (*Cygnus cygnus*), wigeon (*Anas penelope*), curlew (*Numenius arquata*) and lesser black-backed gull approximately 8km from Option A (Red). Several incidental records were received within 2km from Option A (Red) mainly for the areas of Friarstown, Straffan and Lakelands in Naas including two large aggregations of lapwing (*Vanellus vanellus*) and golden plover (*Pluvialis apricaria*). A search of the National Biodiversity Data Centre records included records for several protected species including common frog (*Rana temporaria*), pine marten (*Martes martes*), common lizard (*Zootoca vivipara*), red squirrel (*Sciurus vulgaris*), badger (*Meles meles*) and otter in the vicinity of Option A (Red).

Given the routing of a considerable proportion of the route option along narrow road networks bordered by hedgerows and treelines there will be a requirement for vegetation removal to accommodate the cable installation. The route option is bounded in parts by species rich hedgerows and mature tree lines and the removal of these has the potential to result in habitat fragmentation and impacts on protected species including bats, badger and other small mammals. There is also potential for impacts to wintering and breeding birds through disturbance, habitat loss and pollution during construction. Given the distance of the route option there is a high likelihood that invasive non-native species listed on the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011) as amended will be encountered along the road networks. All lengths of the proposed route option not situated in the road surface have the potential for impacts on biodiversity.

#### 4.1.1.5 Summary of Assessment

The greatest impacts on biodiversity for Option A (Red) would be during construction, where despite cables primarily being laid in public roads, there is potential (especially from passing bays and watercourse crossings) for impacts on hedgerows, tree lines and aquatic ecosystems in particular; other habitats and species may also be disturbed or fragmented during the construction phase and impacts could be permanent in some cases (e.g. in the

event of a permanent off-road maintenance track). In the absence of mitigation, there is the potential for impacts to Rye Water/Cartron SAC in the event of a pollution incident during construction. However out of the four route options, Option A (Red) is located the greatest distance away from this SAC.

In summary there is a **Moderate-High risk (Light Blue)** of a significant impact to biodiversity assets due to Option A (Red).

**Moderate-High**

## 4.1.2 Soils and Water

### 4.1.2.1 Geology and Soils

Option A (Red) is underlain predominantly by Carboniferous limestone bedrock, with associated calcareous shales, sandstone in the north and older Silurian greywacke, siltstone and shale in the south of the Study Area. There are no mapped karst landforms or Geological Heritage sites recorded in the vicinity of the route option. However, the route option crosses rocks in which karst features have been recorded and the potential exists for unmapped features to occur in proximity to the route option. Karst features are associated with the dissolution of limestone and the formation of ground cavities, which may not always be apparent at the surface, with consequent subsidence risks and enhanced subsurface drainage.

Superficial deposits underlying the Option A (Red) route option are predominantly glacial tills, derived from the underlying limestone and, in the north, sandstone and shale bedrock. There is also alluvium associated with watercourses and some limited areas of sand and gravel are crossed by the route in the southern half of the Study Area.

The route option crosses areas of potential geologic economic deposits (sand and gravel, granular aggregate and crushed rock), predominantly in the southern half of the Study Area. However, the areas crossed are small and these deposits are widely available in the surrounding area, so that this is not considered a significant constraint for route selection.

#### 4.1.2.1.1 Summary of Assessment

In terms of geology and soils the overall evaluation for Option A (Red) is ranked as **Low risk (Cream)** risk based on currently available information. However, the potential for unmapped karst features should be noted and further assessment may be needed to identify potential for ground stability issues.

**Low**

### 4.1.2.2 Groundwater

The majority of Option A (Red) lies within the Dublin (poorly productive bedrock) WFD groundwater body, with a small area in the north within the Moynalvy (poorly productive bedrock) and Dunshaughlin (productive fissured bedrock) groundwater bodies. In the southern half of the Study Area the route option crosses the Naas (karstic) and Curragh Gravels East (gravel) groundwater bodies.

The majority of the route option is underlain by bedrock classified as Locally Important Aquifer (bedrock which is generally moderately productive in local zones), with a small area of Regionally Important Aquifer - Karstified (diffuse) crossed in the southern half of the project Study Area. Some areas classified as of High groundwater vulnerability are crossed by the route, predominantly in the southern half of the project Study Area, along with

some very small areas of Extreme groundwater vulnerability. While there are no mapped karst landforms in the vicinity of the route option, the route option crosses rocks in which karst features have been recorded and the potential exists for unmapped features to occur. Karst features can be associated with significant groundwater flowpaths and may be important in supporting surface water features.

There are no Public & Group Supply Source Protection Areas or Group Water Schemes in the vicinity of the route option. There are a large number of groundwater wells and springs mapped by the Geological Survey Ireland across the project Study Area. However, in accordance with TII guidance<sup>20</sup> and the observation that low yielding wells, used mainly for domestic and farm water supply, are very common in Ireland, the assessment has focused on high-yielding springs and wells used for public water supply and their surrounding protection zones and the total number of wells and springs along each route corridor has not been used in assessing relative impacts between route options at this stage.

At this stage of assessment, no groundwater dependent water bodies or groundwater dependent terrestrial ecosystems (GWDTes) have been identified and so these features have not been used in assessing relative impacts between route options at this stage. However, the potential exists for such features to be present within the Study Area and it cannot be conclusively determined at this stage whether or not they may be a constraint for the proposed route.

There is potential for dewatering operations associated with crossings of large watercourses, major roads and railways. This applies to all route options but there is potential higher difficulty associated with the Option A (Red) as both canals are crossed in built up areas, with consequent increased risk of dewatering induced subsidence effects.

#### 4.1.2.2.1 Summary of Assessment

In terms of groundwater the overall evaluation for Option A is ranked as **Low-moderate (Light Green)** risk based on currently available information. However, the potential for unmapped karst features should be noted and further assessment may be needed to identify potential for interference with groundwater flows and potential for groundwater flooding issues.

**Low - Moderate**

#### 4.1.2.3 Surface Water

There are 13 surface waterbodies crossed along the length of Option A (Red). Some are crossed more than once. A full list of water bodies and their current status is provided in Table 4.1 as well as their proximity to the Rye Water Valley/Carton SAC, their sensitivity to change, the likely crossing technique to be employed and the potential for impacts as a result.

<sup>20</sup> TII. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes. Unreferenced. Obtained from: [www.tii.ie/technical-services/environment/planning/](http://www.tii.ie/technical-services/environment/planning/) (accessed October 2021). TII guidelines have been used as they are relevant to all linear infrastructure projects.

**Table 4.1 Surface Water Bodies Option A – Status and Crossing Techniques**

Waterbody	Status	No. Crossings	Connection & Proximity to Rye Water Valley/Cartron SAC (at closest crossing)	Sensitivity	Impact Potential
Liffey_100	Moderate	2	No connection	Medium	Low
Grand Canal Naas Line	Good	1	No connection	Very High	Low
Grand Canal Main Line	Good	1	No connection	Very High	Low
Liffey_120	Good	3	No connection	Very High	Medium
Liffey_130	Good	3	No connection	Very High	Medium
Clonshanbo_010	Poor	2	11km	Low	Low
Lyreen_010	Poor	1	11km	Low	Low
Royal Canal Main Line	Good	1	No connection	Very High	Low
Rye Water_010	Moderate	1	7.75km	Medium	High
Rye Water_020	Moderate	2	8.5km	Medium	High
Rye Water_030	Moderate	1	9km	Medium	Medium
Dunboyne Stream_010	Moderate	1	No connection	Medium	High
Tolka_020	Poor	1	No connection	Low	High
<b>Total</b>		20			

In addition to water bodies being directly crossed by the route option, for Option A (Red) there are also a number in close proximity which may be at risk from unmitigated silty water runoff or spillages of hydrocarbons during construction. These water bodies are less than 50m from the route option:

- Liffey\_120<sup>21</sup>: the route option runs alongside this water body, at approximately 10m from the bank edge, for 375m. The Liffey\_120 is of very high sensitivity and there is a high impact potential from having a trench in such close proximity for this length;
- Liffey\_130: the route option runs alongside this water body, at between 10m and 30m from the bank edge, for 480m. The Liffey\_130 is of very high sensitivity and there is a high impact potential from having a trench in such close proximity for this length; and
- Lyreen\_010: the route option runs alongside this water body, at approximately 10m from the bank edge, for 450m. The Lyreen\_010 is of low sensitivity; the cable is being laid in a road in this location so there is reduced risk of silty water runoff, compared to the two Liffey water bodies. However since it is possible that the surface water drains in the road discharge to the water body, there is a likely pathway for contaminants and a short one also. Therefore there is a low to medium impact potential.

#### 4.1.2.4 Flood Risk

For Option A (Red), the length (in metres) within a PFRA flood risk area is:

- Pluvial: 619m; and
- Fluvial: 1986m.

<sup>21</sup> The Environmental Protection Agency has given technical names to individual watercourses and spilt larger ones in sections. The watercourses could be known locally by different names. The EPA 's names have been used in this report.

There are 20 No. watercourse crossings along the route option; all crossings will be designed so do not present an increase in flood risk, either pluvial or fluvial.

#### 4.1.2.4.1 Summary of Assessment

Considering the number of crossings of water bodies (approximately 20 no.), in particular the crossings of those with high or very high sensitivities, as well as the potential for open cut crossings in addition to potential flood risk, Option A (Red) is scored as **Moderate (Green)** in respect to the Soils and Water assessment topic.

**Moderate**

### 4.1.3 Planning Policy and Land Use

#### 4.1.3.1 Planning Policy and Legislation

Option A (Red) travels along the R156 to the north west towards the Mullagh Crossroads before heading south, along the west of the village of Kilcock, interacting with both the Kilcock Environs LAP in Meath and the Kilcock Town LAP in Kildare along the way. It then travels south around the western side of Clane, avoiding lands zoned within both the Clane LAP and the Prosperous LAP further west. It then heads south before re-joining the other route options north west of Sallins, before diverging towards Naas at Ploopluck along the same path as Option D, interacting with a number of LAP zonings. It passes through Naas West and East before joining the rest of the routes at Killashee and heading south towards Dunstown substation.

#### Kilcock Environs LAP 2009-2015 & Kilcock LAP 2015-2021

Kilcock straddles two Local Authority Boundaries, namely Kildare County Council and Meath County Council. Meath County Council prepared a Local Area Plan for 105 hectares of land in the Kilcock environs within their administrative boundary, while Kildare County Council prepared a Local Area Plan for Kilcock Town.

Option A (Red) is situated on the western side of Kilcock. It traverses both lands zoned in the Kilcock Environs LAP of Meath County Council and Kilcock LAP land zoned by Kildare County Council.

The single type of zoned land Option A (Red) crosses in the Kilcock Environs LAP was zoned F1 (open space) by Meath County Council.

**Table 4.2: Relevant Zoning Objectives Kilcock Environs LAP**

Zoning Objective (Kilcock Environs Local Area Plan 2009-2015)	
Zoning Objective F1	To provide for and improve open spaces for active and passive recreational amenities.

The lands which Option A (Red) traverses are on the north-western quadrant and south-western quadrant of the town and zoned C, E1 and F3 by Kildare County Council.

**Table 4.3: Relevant Zoning Objectives Kilcock LAP**

Zoning Objective (Kilcock LAP 2015-2021)	
Zoning Objective C New Residential	To provide for new residential development in the Bawnogues area of the town. This zoning provides for new residential development and other services incidental to residential development.
Zoning Objective E1 Community & Educational	To provide for institutional, community and educational facilities
Zoning Objective F3 : Open Space & Amenity	To preserve a buffer zone from the Motorway

The north-western quadrant and south-quadrant are divided by the R148, railway line (Dublin-Sligo) and Royal Canal, therefore Option A (Red) would also have to cross this existing infrastructure.

### Draft Naas Local Area Plan 2021-2027

Option A (Red) crosses the railway line (Dublin-Cork) and M7 motorway before entering Millennium Park and via R407 through the Millennium Park to join the R409 through Naas West before travelling south via the R448 through Naas East . The following zonings applicable to Millennium Park, Naas West and Naas East.

**Table 4.4: Relevant Zoning Objectives Naas LAP**

Zoning Objective (Naas Local Area Plan 2021-2027)	
B Existing/Infill Residential	To protect and enhance the amenity of established residential communities and promote sustainable intensification.
C(1) New Residential	To provide for new residential development.
E Community & Education	To provide for education, recreation, community and health
F(2) Strategic Open Space	South of Kilcullen and Ballymore Eustace Roundabouts: These lands comprising 11.94 ha are identified for the development of a proposed active recreation area catering for the future population of this area of town. The development of such facilities shall include the provision of strong links to existing and future residential lands in the surrounding area, as well as the development of the old Naas-Baltinglass/Tullow railway line Greenway.
F3 Strategic Open Space	To preserve, provide for and improve recreational amenity, open space and green infrastructure networks.
H Industry and Warehousing	To provide for industry, manufacturing, distribution and warehousing.
H(5) Industry and Warehousing	To provide for industry, manufacturing, distribution and warehousing.
H(9) Industry and Warehousing	To provide for industry, manufacturing, distribution and warehousing.
I Agriculture	To retain and protect agricultural uses.
K(2) Commercial/Residential	To provide for commercial and appropriate residential mixed-use developments.
P1 Data Centre /Warehouse	To provide for Data Centre development and their associated infrastructure only.
Q4 Office, Enterprise and Employment	To provide for and facilitate the provision of high job-generating uses.
Q5 Office . Enterprise and Employment	To provide for and facilitate the provision of high job-generating uses.
U Utilities	To provide for and improve public utilities

### 4.1.3.2 Planning Applications

A review of all granted and live applications over the last five years within a 50m buffer 25m either side of Option A (Red) has been performed. Some of these applications will be new receptors which will have already been constructed by the time construction on the Proposed Project commences. These include both individual dwellings and larger development as shown in the Local Area Plans (LAPs). Of these, some of the larger applications and their locations are highlighted in the table below.

**Table 4.5: Notable Applications in proximity to Option A (Red)**

Local Authority	App. Number	Brief Description	Address	Status
Kildare County Council	16434	New right hand turning lane, bus set down area and associated works, lift to existing 110kv overhead power lines, removal of derelict prefabricated structures and culvert of ditch within site and construction of a 10,450sqm two & three storey 1000 pupil post-primary school and associated infrastructure; ESB substation, 92 carpark & 250 cycle parking spaces, bus and car set down & pick up facilities, play areas	Plots No. 71 and 72 and part Plots 85 and 86 of the Millennium Park Master Plan , Millennium Park , Naas	Granted 09/06/2017
Kildare County Council	161145	183 no. residential dwellings comprising 16 no. 2-two storey terrace dwellings (Type A); 134 no. 3-bed two storey terrace and semi-detached dwellings (Type A1 & B) and 33 no. 4-bed two storey semi-detached and detached dwellings (Type C, C1 & C2); provision of single storey childcare facility (approximately 324sq.m GFA); and associated infrastructure.	Jigginstown , Naas , Co. Kildare	Granted 16/06/2017
Kildare County Council	17886	Amendment to previously permitted residential development Ref. 16/1145. Proposed amendments relate to 83 No. units only, representing Phase 1 & 2 of the permitted scheme, and comprises of minor modifications to elevational treatments, together with associated and ancillary modifications at a site	Jigginstown , Naas , Co. Kildare.	Granted 09/11/2017
Kildare County Council	20840	the construction of a 5627sqm Specialist Packaging Single Storey High Level Manufacturing Facility with Three Storey Head office and associated infrastructure	Millennium Business Park , Osberstown , Naas	Granted 30/03/2021 (currently under financial appeal)
Kildare County Council	201564	(a) Extension of existing 7.3m wide two-lane carriageway by 137m to north (b) 2m grass verge, 2m cycle path and 2m footpath along east & west of proposed access road extension (c) vehicular entrance to west of proposed extension to facilitate proposed access to a planned commercial development (Kildare Co. Co. Ref. 20840) (d) vehicular entrance to east of proposed extension to facilitate proposed access to planned commercial development (Kildare Co. Co. Ref. 20561) (e) parking provision & associated infrastructure	Millennium Park , Osberstown , Naas	Granted 01/07/2021
Kildare County Council	19305701	STRATEGIC HOUSING DEVELOPMENT (ABP Decision) - the demolition of an existing dwelling and agricultural buildings on the subject site and the construction of a residential development of 314 no. dwellings, a crèche (c. 610sqm), retail unit (c. 169sqm)	Naas West & , Jigginstown , Naas	Granted 13/03/2020
Kildare County Council	211454	the construction of a permanent fourth arm on the Southern Ring Road/Devoy Link Road roundabout to serve future lands to the south of the Southern Ring Road and provision of a temporary construction related car park for a maximum of	Naas West , Naas , Co. Kildare.	New Application



Local Authority	App. Number	Brief Description	Address	Status
		100 No. cars for a period of 3 No. years to serve the construction of the Elsmore, and Whitethorn residential developments to the north, permitted under SHD Ref: ABP-305701-19.		

These applications, as well as the more minor/domestic applications, will be taken into account in the routing of the cable. Other larger scale planning applications will also be examined and taken into account within the routing process. Such applications include other energy projects, the Water Supply Project, and road schemes.

#### 4.1.3.3 Summary of Assessment

Taking the above into account, Option A has the potential to interact with a significant number of granted and live planning applications, as well as zonings within the Kilcock Environs, Kilcock Town, and Draft Naas LAPs. However, it is also acknowledged that with appropriate siting and mitigation, the impacts of these interactions can be minimised. Therefore, Option A has been assigned **Moderate risk (Green)** in terms of the combined impacts to land use and planning policy.

Moderate

### 4.1.4 Landscape

#### 4.1.4.1 Landscape character

##### 4.1.4.1.1 Sensitivity – landscape character

Whilst influenced by the value and sensitivity judgements for particular Landscape Character Areas in the County Landscape Character Assessments for Meath and Kildare, independent landscape sensitivity judgements are provided for this assessment based on the more universal criteria, which are derived from the GLVIA-2013 Guidelines (Landscape Institute and Institute of Environmental Management & Assessment 2013) and accounts for the susceptibility of the landscape to the Proposed Project. This approach is consistent with best practice and also accounts for the inconsistency that commonly occurs in assigning landscape sensitivity to similar or adjoining landscape units between Counties. Furthermore, the receiving landscape is considered at a finer grain than that of a County-wide Landscape Character Assessment.

Option A (Red), like the others, involves a piece of linear underground infrastructure which, similar to water and waste pipes, are, by their very nature, difficult to discern once operational. Construction activity will be localised, transitory and will largely occur along the road network. For these reasons, the sensitivity of the landscape character within the Study Area to a project of this nature is deemed to be low-negligible.

##### 4.1.4.1.2 Magnitude of impacts – landscape character

For all route options, the conductor will be installed below-ground in a 1.8m wide and 1.5m deep trench with joint bays (and associated temporary passing bays) positioned at intervals along the route; thus, the physical impact of the trench on the landscape is modest in scale, contained within already modified ground, temporary in duration, transient in location and reversible. Impacts on the land-cover will be limited to a 12m wide swathe within which some vegetation will need to be removed. During the construction phase, there may be a small degree of impact at certain locations within this swathe; however, it would not be at a scale that would have any material impact on

the overall landscape fabric or on the landscape character along the route. Although construction activity may alter the landscape character in the immediate vicinity of where the cable is being laid, it will be transitory and temporary. Impacts will predominantly occur on the road network where vehicular movements are already part of the existing character.

The trenches will be backfilled, top soiled and vegetation will be reinstated having regard for agricultural land-use and/or biodiversity requirements. Any potentially noticeable permanent changes will be highly localised and will generally be limited to river crossings and where it was not possible to reinstate vegetation directly over the cable trench/within the permanent wayleave (noting that pre-existing hedged or wooded habitats cannot be re-instated over the cable duct). For these reasons, the magnitude of impact on the landscape character within the Study Area due to the Proposed Project will be low-negligible during the construction phase and negligible during the operational phase.

#### 4.1.4.1.3 Significance of impacts – landscape character

When the magnitude of impact on the landscape character is considered in conjunction with the low-negligible sensitivity of the landscape within the Study Area, it is anticipated that the significance of the impacts will be **Slight-Imperceptible** during the construction phase and **Imperceptible** during the operational phase.

**Table 4.6: Summary - landscape character**

Landscape Character Area/Type	Summary of landscape character assessment in County Development Plan	Landscape sensitivity	Likely operational magnitude of impact	Likely operational significance of impact
Meath 10. The Ward Lowlands	<ul style="list-style-type: none"> <li>Landscape Character Type: Lowland Landscape</li> <li>Value: Low</li> <li>Importance: Regional</li> <li>Sensitivity: High</li> <li>Potential capacity to accommodate development - underground services: Low</li> </ul>	Low-negligible	Negligible	Imperceptible
Meath 11. South East Lowlands	<ul style="list-style-type: none"> <li>Landscape Character Type: Lowland Landscape</li> <li>Value: Very High</li> <li>Importance: Regional</li> <li>Sensitivity: Medium</li> <li>Potential capacity to accommodate development - underground services: Medium</li> </ul>	Low-negligible	Negligible	Imperceptible
Meath 12. Tara Skryne Hills	<ul style="list-style-type: none"> <li>Landscape Character Type: Hills and Upland Areas (southern portion of this area that does not encompass Hill of Tara or Skryne Hill)</li> <li>Value: Exceptional</li> <li>Importance: National/International</li> <li>Sensitivity: High</li> <li>Potential capacity to accommodate development - underground services: Low</li> </ul>	Low-negligible	Negligible	Imperceptible

Landscape Character Area/Type	Summary of landscape character assessment in County Development Plan	Landscape sensitivity	Likely operational magnitude of impact	Likely operational significance of impact
Meath: 13. Rathmoylan Lowlands	<ul style="list-style-type: none"> <li>Landscape Character Type: Lowland Landscape</li> <li>Value: High</li> <li>Importance: National</li> <li>Sensitivity: High</li> <li>Potential capacity to accommodate development - underground services: Low</li> </ul>	Low-negligible	Negligible	Imperceptible
Meath: 14. Royal Canal	<ul style="list-style-type: none"> <li>Landscape Character Type: River Corridor and Estuaries</li> <li>Value: High</li> <li>Importance: Regional</li> <li>Sensitivity: Medium</li> <li>Potential capacity to accommodate development - underground services: Medium</li> </ul>	Low-negligible	Negligible	Imperceptible
Kildare: Chair of Kildare	<ul style="list-style-type: none"> <li>Class 4 – Special Sensitivity</li> </ul>	Low-negligible	Negligible	Imperceptible
Kildare: Northern Lowlands	<ul style="list-style-type: none"> <li>Class 1 – Low Sensitivity</li> </ul>	Low-negligible	Negligible	Imperceptible
Kildare: North-western Lowlands	<ul style="list-style-type: none"> <li>Class 1 – Low Sensitivity</li> </ul>	Low-negligible	Negligible	Imperceptible
Kildare: Western Boglands	<ul style="list-style-type: none"> <li>Class 3 – High Sensitivity</li> </ul>	Low-negligible	Negligible	Imperceptible
Kildare: Northern Hills	<ul style="list-style-type: none"> <li>Class 4 – Special Sensitivity</li> </ul>	Low-negligible	Negligible	Imperceptible
Kildare: Allen Bog	<ul style="list-style-type: none"> <li>Class 4 – Special Sensitivity</li> </ul>	Low-negligible	Negligible	Imperceptible
Kildare: Pollardstown Fen	<ul style="list-style-type: none"> <li>Class 5 – Unique Sensitivity</li> <li>Areas of High Amenity</li> </ul>	Low-negligible	Negligible	Imperceptible
Kildare: The Curragh	<ul style="list-style-type: none"> <li>Class 5 – Unique Sensitivity</li> <li>Areas of High Amenity</li> </ul>	Low-negligible	Negligible	Imperceptible
Kildare: Central Undulating Lands	<ul style="list-style-type: none"> <li>Class 1 – Low Sensitivity</li> </ul>	Low-negligible	Negligible	Imperceptible
Kildare: Eastern Transition	<ul style="list-style-type: none"> <li>Class 2 – Medium Sensitivity</li> </ul>	Low-negligible	Negligible	Imperceptible
Kildare: River Liffey	<ul style="list-style-type: none"> <li>Class 4 – Special Sensitivity</li> <li>Areas of High Amenity</li> </ul>	Low-negligible	Negligible	Imperceptible

Landscape Character Area/Type	Summary of landscape character assessment in County Development Plan	Landscape sensitivity	Likely operational magnitude of impact	Likely operational significance of impact
Kildare: Eastern Uplands	<ul style="list-style-type: none"> <li>Class 3 – High Sensitivity</li> <li>Areas of High Amenity</li> </ul>	Low-negligible	Negligible	Imperceptible

#### 4.1.4.2 Landscape elements

No designated or highly sensitive landscape elements were identified within the portion of the Study Area that occurs within County Meath.

Included in Table 14.4 of Chapter 14 (and indicated on Map 14.2) of the Kildare County Development Plan are:

*'12 "principal landscape sensitivity factors": Major Rivers and Water bodies; Canals; Ridgelines; Green Urban Areas; Broad-Leaved Forestry; Mixed Forestry; Natural Grasslands; Moors and Heathlands; Agricultural Land with Natural Vegetation; Peat Bogs; Scenic View; and Scenic route'.*

This option will pass within 300m of the following 'principal landscape sensitivity factors' (from north to south):

- Woodland near the R407 regional road;
- River Liffey; and
- Woodland R412 regional road.

##### 4.1.4.2.1 Sensitivity - landscape elements

The sensitivity of these 'principal landscape sensitivity factors' are recorded in Table 4.7.

##### 4.1.4.2.2 Magnitude of impacts - landscape elements

The magnitude of impacts on landscape elements are as follows:

- **Woodland near the R407 Regional road:** It is likely that the R407 regional road is wide enough to accommodate the cable trench without the need to remove roadside vegetation; therefore, there will be no material change to the view and thus the magnitude of impact is deemed to be negligible during both the construction and operational phases;
- **River Liffey:** Approximately 3.7km of the route passes within an area of 'special sensitivity' that buffers the River Liffey 'principal landscape sensitivity factor'. This area would have a heightened sensitivity to the removal of vegetation. Within this 'principal landscape sensitivity factor' approximately 5.6km of the route occurs within agricultural fields; thus, the construction activity here would be uncharacteristic. For these reasons, the magnitude of impact during the construction phase is deemed to be low. The agricultural land use will be reinstated, and the river crossing is likely to be by directional drilling; therefore the likely magnitude of impact during the operational phase is likely to be negligible; and
- **Woodland R412 Regional road:** It is likely that the R412 regional road is wide enough to accommodate the trenching work without the need to remove roadside vegetation; therefore, there will be no material change. Thus the magnitude of impact is deemed to be negligible during both the construction and operational phases.

#### 4.1.4.2.3 Significance of impacts - landscape elements

All the impacts on the '*principal landscape sensitivity factors*' identified are of a negligible magnitude during the operational phase; therefore, all are considered, by default, to have a significance of impact that is **Imperceptible**. During the construction phase only the River Liffey '*principal landscape sensitivity factor*' is likely to have a significance of **Slight-Imperceptible**, while for all the others, it will be **Imperceptible**.

**Table 4.7: Summary - Principal Landscape Sensitivity Factors within County Kildare**

Principal Landscape Sensitivity Factor	Specific feature	Sensitivity of feature	Likely operational magnitude of impact	Likely operational significance of impact
Major Rivers and Water bodies	River Liffey	High-medium	Negligible	Imperceptible
Mixed Forestry	Woodland near the R407 regional road	High	Negligible	Imperceptible
Mixed Forestry	Woodland R412 regional road	High	Negligible	Imperceptible

#### 4.1.4.3 Summary of Assessment

A 5.6km offline section passes through agricultural fields near the River Liffey '*Principal Landscape Sensitivity Factor*'; therefore, there is a potential for some impact on the landscape character within this area of 'special' sensitivity, but significant impacts are not anticipated. Assuming riparian vegetation along the west bank of the River Liffey is to be retained, and protected by a Root Protection Zone during construction, then no significant landscape or visual impacts are anticipated. Whilst the magnitude of impact during both construction and operation is at the very bottom end of the magnitude spectrum; some receptors are deemed to have a sensitivity that is at the upper end of the sensitivity spectrum thus a relatively small increase in the magnitude of impact during the construction phase could result in a significant impact therefore the attributed risk score is **Low-Moderate (Light Green)**.

Low - Moderate

## 4.1.5 Archaeology, Architectural Heritage, and Cultural Heritage

A summary of archaeology, architectural heritage, and cultural heritage constraints identified within the Step 3 Project Study Area is presented in the Environmental Constraints Report<sup>22</sup> along with a discussion on the general character and nature of the constraints present, comprising National Monuments and Preservation Orders, sites on the RHM, Recorded Monuments and sites recorded on the SMR, Protected Structures, structures recorded on the NIAH, ACAs, and GDLs identified by the Survey of Historic Gardens and Designed Landscapes.

Baseline information on the archaeology, architectural heritage and cultural heritage constraints identified within 100m of Option A (Red) is provided in Appendix B.1 and these constraints are shown in Appendix B.1.

### 4.1.5.1 Archaeology

The Jigginstown Castle complex, comprising one National Monument (AY\_39; also a Protected Structure, AH\_16) and three sites with Preservation Orders placed on them (AY\_40, AY\_42, and AY\_43), is located approximately 40m to the west of Option A (Red). The complex includes two further sites with Preservation Orders placed on them (AY\_38, AY\_44; also a Protected Structure, AH\_17) approximately 195m and 230m to the west of Option A (Red), respectively. Five of these sites (AY\_38, AY\_39, AY\_42, AY\_43, and AY\_44; see Appendix B.1), are also on the RHM.

A linear earthwork (AY\_13), a site on the RHM, is located immediately to the east of Option A (Red).

A total of four<sup>23</sup> Recorded Monuments are located within 100m of Option A (Red) (see Appendix B.1). These comprise an earthen mound (AY\_02) associated with 'Brides Well' (see AY\_01), a field system of unknown date comprising upstanding banks and ditches (AY\_03), a poorly preserved early medieval rath (AY\_24), and an earthen 'moat' (AY\_26; also a Protected Structure).

A total of six sites recorded on the SMR have been identified within 100m of Option A (Red). These are characterised by the locations of cropmarks and evidence of post-medieval religious and domestic activity (AY\_01, AY\_27, AY\_36, AY\_46 – 8).

Further information on the archaeological constraints identified within 100m of Option A (Red) is included in Appendix B.1 and are shown in Appendix B.1.

#### 4.1.5.1.1 Archaeological Potential

Areas of alluvium, lake marl and raised peat identified along the route have the potential to preserve previously unknown archaeological monuments and remains, including palaeoenvironmental<sup>24</sup> remains and preserved organic materials. There is also the potential for votive offerings, objects apparently deposited for religious reasons, in bog and in rivers such River Liffey and the Rye Water, as well as in minor watercourses.

### 4.1.5.2 Architectural Heritage

Architectural heritage constraints within 100m of Option A (Red) comprise:

- Five Protected Structures comprising four houses (AH\_06, AH\_11, AH\_15, and AH\_18) and a church and lych gate (AH\_12).
- One country house recorded on the NIAH (Larch Hill House; AH\_01).

<sup>22</sup> Jacobs. 2021. Step 4A Environmental Constraints Report. Available at:

<https://consult.eirgrid.ie/system/files/materials/2055/Environmental%20Constraints%20Report%20-%20Step%204A%20-%20KMGU.pdf>.

<sup>23</sup> A further Recorded Monument, a linear earthwork located immediately to the east of Option A (Red) (AY\_13), is also on the RHM and, to avoid double counting constraints, is described above.

<sup>24</sup> An environment at a period in the geological past.

- 12 GDLs comprising ten recorded by the Survey of Historic Gardens and Designed Landscapes and two identified from historic mapping (Ordnance Survey 6", 1837 – 1842).

No ACAs are located within 100m of Option A (Red).

Further information on the architectural constraints identified within 100m of Option A (Red) is included in Appendix B.1.

### 4.1.5.3 Cultural Heritage

A total of 27 cultural heritage sites have been identified within 100m of Option A (Red) from the sources identified in Section 2.3.1.5. These are largely characterised by post-medieval built heritage including stone road bridges, houses and farm buildings. Further information on these cultural heritage sites is presented in Appendix B.1.

### 4.1.5.4 Potential Impacts on Archaeological, Architectural and Cultural Heritage

#### 4.1.5.4.1 Construction – Direct Impacts

##### Archaeology

No direct impacts have been identified on National Monuments, sites with Preservation Orders, or sites on the RHM as a result of the construction of Option A (Red).

Where Option A (Red) is located within the Zone of Notification associated with a Recorded Monument, this has been identified as a direct impact below. While the option would not directly impact the Recorded Monument itself, excavation of the cable trench and joint bays would have a direct impact on any archaeological remains that may survive within this zone.

Option A (Red) is located within the Zones of Notification of four Recorded Monuments (AY\_02, AY\_13, AY\_24 and AY\_26<sup>25</sup>). Within these zones the option is located in the carriageway of existing roads the construction of which is more than likely to have removed or truncated any archaeological remains associated with these monuments that may have been present. However, construction, including the excavation of the cable trench and joint bays would have a direct impact on any archaeological remains that may survive. Construction would also have a direct impact on any archaeological remains associated with these Recorded Monuments that may survive within any additional land take required for construction (e.g. in temporary passing bays).

While construction of the existing access track to Dunstown substation may have partially removed or truncated any remains associated with AY\_46 – 48, construction of Option A (Red) including the excavation of the cable trench and joint bays would have a direct impact on any archaeological remains associated with these constraints that may survive. In addition construction would have a direct impact on any unknown archaeological remains associated with AY\_46 – 48 that may survive within any additional land take required for construction.

Excavation of the cable trench and joint bays, and the excavation of temporary launch and reception pits for directional drilling may also result in a direct impact to any previously unknown archaeological remains that may be present within the land required for Option A (Red). The potential for this impact is considered to be higher in previously undeveloped areas than within the existing carriageways, the construction of which is likely to have likely to have removed or truncated any archaeological remains that may have been present.

<sup>25</sup> Please note, this constraint is also a Protected Structure (RPS B14-07; tumulus); however, given the option is located within the Zone of Notification associated with the Recorded Monument (AY\_26), a direct impact on the monument itself is not predicted and therefore, no direct impact has been identified on the Protected Structure.



## Architectural Heritage

Welds Thatched House (AH\_11), which is a Protected Structure and has been assessed by the NIAH to be of Regional importance, Millicent Church and Lych Gate (AH\_12), a Protected Structure, and one historic building assessed by the NIAH to be of Regional importance (AH\_01) are located immediately adjacent to Option A (Red). There is therefore potential for a direct impact on these architectural heritage constraints as a result of accidental damage from construction plant.

Should Option A (Red) require additional land take for construction, the removal of boundary features would have a direct impact on ten GDLs (Jenkestown House; DL\_02, Phepotstown House; DL\_03, Larch Hill House; DL\_04, Calgath House; DL\_06, Brides Stream House; DL\_07, Painestown House; DL\_10, Firmount House; DL\_14, Moatfield House; DL\_15, Millicent House; DL\_17, and Killashee House; DL\_20).

## Cultural Heritage

Six post-medieval stone road bridge are located on the existing road network (CH\_01, CH\_04, CH\_06, CH\_07, CH\_12, and CH\_24). There is therefore potential for a direct impact on these cultural heritage constraints as a result of accidental damage from construction plant.

Option A (Red) is located within the site of a racecourse (CH\_14). The excavation of the cable trench and joint bays, and the excavation of temporary launch and reception pits for directional drilling, would have a direct impact through the removal of any surviving remains associated with this constraint.

CH\_03 is a public house located immediately adjacent Option A (Red). There is therefore potential for a direct impact on this cultural heritage constraint as a result of accidental damage from construction plant.

### 4.1.5.4.2 Construction - Indirect Impacts

#### Archaeology

Option A (Red) is located approximately 40m to the east of the boundary of Jigginstown Castle complex, which comprises a National Monument (AY\_39) and five sites with Preservation Orders (AY\_38, AY\_40, AY\_42, AY\_43, and AY\_44) (five of which are also sites on the RHM), and two Protected Structures (AH\_16 and AH\_17). Noise and visual intrusion from construction plant may have an indirect impact on this complex. However, it is anticipated any intrusion would be temporary (lasting the duration of construction in this location) and would be largely screened by the intervening mature trees along the eastern boundary of the complex which would be retained.

#### Architectural Heritage

This option is located within 65m the following five Protected Structures<sup>26</sup>:

- Moortown (AH\_06; assessed by the NIAH to be of Regional importance);
- Ballynagappagh (AH\_11; assessed by the NIAH to be of Regional importance);
- Millicent Church and Lych Gate (AH\_12);
- Millicent Estate Houses (AH\_15); and
- Bluebell Farm House (AH\_18).

<sup>26</sup> Please note, indirect impacts have been identified on two additional Protected Structures (AH\_16 and AH\_17); however, these form part of the Jigginstown Castle complex and have been considered alongside the archaeological constraints that form this group.

While there is potential for an indirect impact on the setting of these constraints during construction due to noise and visual intrusion from construction plant, it is anticipated any intrusion would be temporary (lasting the duration of construction in each location) and would largely be screened by established vegetation and intervening built features.

### **Cultural Heritage**

Movement and operation of plant during the construction of Option A (Red) would have an indirect impact on the setting of 12 cultural heritage sites (CH\_03, CH\_05, CH\_15, CH\_16, CH\_17, CH\_37, CH\_43, CH\_46, CH\_55, CH\_57, CH\_58, and CH\_59). However, it is anticipated any intrusion would be temporary (lasting the duration of construction in each location).

#### **4.1.5.4.3 Operational Impacts**

As the Proposed Project would be located beneath the road surface, and any offline sections would be reinstated after construction no impacts on archaeological, architectural or cultural heritage constraints have been assessed as a result of the operation of Option A (Red).

#### **4.1.5.5 Summary of Assessment**

While Option A (Red) may result in fewer impacts on sites identified on the SMR than the other route options and has the least off-road sections (totalling approximately 5.9km), Option A (Red) would potentially have a direct impact on the highest number of Recorded Monuments (five) and Protected Structures (two). This route option also has the potential to directly impact the highest number of GDLs (ten).

Option A (Red) also has the potential for an indirect impact on the Jiginstown Castle complex. Due to these potential impacts, Option A (Red) has been assigned a risk of **'Moderate-High' (Light Blue)**.

**Moderate-High**

A Route Corridor Summary Matrix for archaeology, architectural heritage and cultural heritage is provided in Appendix B.1.

As the project progresses it may be possible to avoid impacts on archaeology, architectural heritage, and cultural heritage constraints through design, including localised realignments of the route. Where impacts on archaeology, architectural heritage, and cultural heritage constraints cannot be avoided it is possible impacts could be reduced through recording in advance of, or during, construction, including the archiving and documentation of the results of this recording for public reference.

## 4.2 Socio-Economic

### 4.2.1 Traffic, Transport and Access

From a traffic perspective all the potential route options identified for the Proposed Project aim to maximise the use of national, regional, and local roads by avoiding, where possible, the motorways, going off-road, through private land and through agricultural land and have been assessed based on number of themes as below.

Option A (Red) is the most westerly of the shortlisted route options and the longest between the Woodland and Dunstown substations. The route option is mainly located along regional and local roads, running close to the town of Kilcock and bypassing the towns of Clane and Sallins before re-joining the regional road network at Naas and passing close to residential areas in the south-west of the town.

Table 4.8 presents the break-down of road classifications for Option A (Red).

**Table 4.8: Option A (Red) Road Classification**

Option	Total Length (km)	Road Length Percentage Distribution		
		Regional	Local Roads and Smaller	Off-road and other Land Types
Option A (Red)	51.4	64.2%	20.6%	15.2%

Option A (Red) route is proposed mainly along the regional roads, with a smaller proportion of the proposed route running through local roads. There are some off-road sections along this route option, in particular west of Kilcock and Clane. Option A (Red) affects the greatest percentage of regional roads of the four potential options, at 64%.

Along stretches of this regional road network it has been identified that the construction works will reduce the carriageway width to 2.5m-3.0m, particularly along the route sections (single lane in either direction) where limited additional width (hardshoulder, footway or verge etc.) is available. Therefore temporary road closures and associated diversions will be required to accommodate this phased construction work. Some of these road closures have been identified and discussed at Section 4.4.2 under Deliverability. It is acknowledged that these closures and diversions will likely have an impact on vehicles in terms of additional delay and journey time reliability during periods of the day. However to minimise this impact, these temporary closures and diversions will be tested and assessed in robust traffic management plans prior to implementation. Where road closures are not required, some localised traffic management measures will also be introduced in a traffic management plan.

A review of the Option A (Red) also highlights that the construction works will likely impact a number of key junctions and roundabouts. These sections are also identified in Section 4.4.2. Similar to the route sections there might be a requirement to temporarily divert traffic or restrict certain vehicle movements at these locations. Traffic management measures would be assessed on a case-by-case basis for each signalised junction and standard roundabout. The number of key junctions impacted along Option A (Red) is the second highest compared to other potential route options.

Option A (Red) also has the second highest number of properties within 0 to 50 meters from the roadway centreline (433 properties), and as a result it is anticipated that there will be significant local traffic disruption to access during

construction. Access is anticipated to be disrupted to Larch Hill Gardens, Mountpleasant Lodge Nursing Home and five schools along the R448, south of Naas.

#### 4.2.1.1 Summary of Assessment

Option A (Red) is the longest proposed route and also affects the greatest percentage of regional roads among the four potential route options. In addition, Option A (Red) has the second highest number of properties within 50 meters along its route and passes a nursing home and five schools. Therefore in terms of risk of traffic disruption, the Traffic, Transport and Access (Social) criteria for Option A (Red) is assessed to be **'Moderate-High' (Light Blue)**. It is acknowledged that the phased construction works will have an impact on private vehicles using this route, however this impact will only be temporary and the traffic management measures or diversions will be planned to minimise this traffic impact. A robust traffic management plan will be proposed for each phase of construction and the traffic management measures will be tested and analysed before implementation. The use of regional roads will generally affect more traffic as these types of roads are busier than local roads. However their use allows less full road closures as regional roads are generally wider and so lane closures with temporary traffic lights/stop-go systems can be put into place. Full road closures will result in more disruption through diversions. Mitigation measures through consultation and traffic management will reduce the impacts. The measures can include ensuring that the works do not disrupt access to the nursing home and the schools. Phasing of the works will be important to minimise disruption. This can be done by ensuring that works are completed at less busy times and are carefully planned to avoid road users being disrupted in multiple locations by construction teams in one journey. These measures will be designed at the next step in the Proposed Project.

Moderate-High

### 4.2.2 Noise, Vibration and Air Quality

#### 4.2.2.1 Noise and Vibration

##### 4.2.2.1.1 Baseline

Option A (Red) runs along the western portion of the Study Area between the Woodland and Dunstown substations. The route option is mainly located along regional and local roads, running close to the town of Kilcock and bypassing the towns of Clane and Sallins before re-joining the regional road network at Naas and going close to residential areas in the south-west of the town. There are some off-road areas in this route, in particular west of Kilcock and west of Clane. Offline or off-road sections are sections where the route option does not follow alongside a road but cuts across, for example, agricultural land.

Baseline noise levels are likely to vary along this route option with higher noise levels likely closer to transport infrastructure and during periods of peak transport activity. The main noise source along this route option is from road traffic noise. Environmental Protection Agency (EPA) traffic noise data for Round 3 contained in EPA Maps<sup>27</sup> shows that traffic noise levels will be highest where the route crosses the M4, the R403 and the M7 and where it runs alongside the R407 and the R448.

EPA railway noise data shows that where the route crosses the Dublin to Cork railway line rail noise levels are elevated.

<sup>27</sup> <https://gis.epa.ie/EPAMaps/>

#### 4.2.2.1.2 Methodology

The noise and vibration assessment at this stage of the Proposed Project involves gaining an appreciation of the baseline noise environment close to each of the proposed route options and identifying noise and vibration sensitive receptors within distance bands up to 300m from each of the proposed routes. Noise impacts from construction activities do not normally occur beyond 300m and vibration impacts do not normally occur beyond 100m. The locations of major crossings where HDD is likely to be required and off-road sections where noise impacts are likely to be greater compared to on-road sections is also used to assess each route in terms of the noise risk according to the multi criteria analysis at Step 4A. The risk scale is as follows:

- High: dark blue;
- Moderate-high: blue;
- Moderate: dark green;
- Low-moderate: green; and
- Low: cream.

No baseline noise surveys were undertaken, and no noise modelling was undertaken at this stage of the Proposed Project. However these will be completed at Step 5 of the Proposed Project.

#### 4.2.2.1.3 Noise and Vibration Sensitive Receptors

Table 4.9 shows the residential property counts in distance bands up to 300m from the proposed route. Overall, there are a total of 2657 sensitive receptors within 300m of the proposed route.

**Table 4.9: Residential Property Counts within 300m of Option A (Red)**

Option	No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	No. of sensitive receptors 100-200m	No. of sensitive receptors 200-300m	Total no. of receptors within 300m
A	433	414	802	1008	2657

As well as residential properties there are other sensitive receptors within 300m of the proposed route and which are not included in the above counts including:

- Millicent Golf Club;
- Gaelscoil Nás Na Ríogh School;
- St David's National School;
- Piper's Hill College;
- Killashee National School; and
- Several equine operations.

#### 4.2.2.1.4 Potential Noise and Vibration Impacts

##### Areas of Potential Horizontal Directional Drilling (HDD)

There is greater potential for adverse noise and/or vibration impacts at sensitive receptors where construction activities would occur over a longer period (e.g. at trenchless crossings). It is recognised that certain construction activities at certain trenchless crossings could be required to take place outside of normal working hours, which would increase the likelihood of adverse noise effects occurring. In addition, certain potential trenchless crossing techniques that may be employed (e.g. HDD) also have the potential to cause adverse vibration impacts at nearby receptors.

There is potential for adverse impacts at receptors within 300m of HDD works and there could be six major crossings on Option A (Red). An initial assessment has shown there are the potential for adverse noise impacts at the Royal Canal Main Line, the Dublin–Sligo Railway line, the M4 Motorway, the Dublin–Cork railway line, and the M7 Motorway.

### Offline sections

For the majority of the proposed route option, the underground cables are expected to be installed using ‘Open Cut’ techniques. Where ‘Open Cut’ works are undertaken adjacent to the existing road network, there is a relatively low potential for temporary impacts due to construction noise. This is due to the relatively high levels of local environmental noise that are typically experienced adjacent to roads. Also, as the works are expected to progress in sections, noise levels at any receptor would only be elevated for a relatively short period of time. However, where ‘Open Cut’ works are undertaken in relatively quiet areas (such as offline sections) close to sensitive receptors there is the potential for adverse temporary impacts due to construction noise.

Table 4.10 shows the total length, the total offline length and whether there are receptors within 300m of the offline route for Option A (Red).

**Table 4.10: Total length and total offline length for Option A (Red)**

Option	Total Length (km)	Offline Length (km)	Receptors within 300m of offline section
A (Red)	51.4	6	Yes

The table above shows that the route option goes offline for approximately 5.9km of its total length where there is a greater potential to result in adverse noise effects at receptors compared to where works are undertaken adjacent to existing roads.

### 4.2.2.2 Summary of Assessment

There are relatively large numbers of receptors within 300m of Option A (Red), there is 5.9km of potential offline construction activity and there are receptors within 300m of major crossings at six crossing points with the potential for experiencing adverse noise and/or vibration effects, therefore it is appropriate to give a risk score of ‘**Moderate (Dark Green)**’.

**Moderate**

### 4.2.2.3 Air Quality

#### 4.2.2.3.1 Baseline

Option A (Red) runs along the western portion of the Study Area between the Woodland and Dunstown substations. The route is mainly located adjacent to regional and local roads, running close to the town of Kilcock and bypassing the towns of Clane and Sallins before re-joining the regional road network at Naas and going close to residential areas in the south-west of the town. There are some offline sections (i.e. not within roads) in this route, in particular west of Kilcock and west of Clane.

Baseline air pollutant concentrations are likely to vary along this route due to the difference in emissions between the rural and urban environment. Higher concentrations are likely at locations closer to transport infrastructure and where the route option is closer to larger settlements. The main air quality sources along this route option are from road traffic, particularly where the route option crosses or is close to the M4 and the M7.

The Air Quality Index for Health across the Study Area<sup>28</sup> is Good (with an index score ranging from 1-3). The majority of the Study Area, as defined by the Environmental Protection Agency (EPA)<sup>29</sup>, is located within Air Quality Zone D – Rural Ireland apart from locations in Naas, which are within Air Quality Zone C – other cities and large towns.

#### 4.2.2.3.2 Sensitive receptors

For human exposure to air pollutants, sensitive receptors (termed 'human receptors') include, for example, residential properties, schools and care homes. Air pollutants can also impact on sensitive vegetation and habitats (termed 'ecological receptors'). These include the following ecological receptor designations:

- Special Area of Conservation (SAC);
- Special Protection Area (SPA);
- Ramsar site;
- Natural Heritage Area (NHA) and proposed NHA (pNHA); and
- Ancient Woodland.

The Institute of Air Quality Management (IAQM) dust guidance<sup>30</sup>, has been adapted for the purposes of this assessment. The number of residential properties and schools have been counted and identified as receptors.

Table 4.11 shows the human receptor count within 300m of each of Option A (Red).

**Table 4.11 Sensitive Receptors within 300m of Option A (Red)**

Option	No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	No. of sensitive receptors 100-200m	No. of sensitive receptors 200-300m	Total no. of receptors within 300m
A	433	414	802	1008	2657

Option A (Red) passes the following schools:

- Gaelscoil Nás Na Ríogh School;
- St David's National School;
- Piper's Hill College; and
- Killashee National School.

With regard to ecological receptors, Option A (Red) crosses the Royal Canal pNHA and crosses the Grand Canal pNHA twice. Therefore, these are in close proximity (i.e. less than 20m) from the route.

<sup>28</sup> Environmental Protection Agency (EPA), Air Quality Index for Health, <https://airquality.ie/information/air-quality-index-for-health>, accessed October 2021.

<sup>29</sup> Environmental Protection Agency (EPA), Air Quality Zones, <https://airquality.ie/information/air-quality-zones>, accessed October 2021.

<sup>30</sup> Institute of Air Quality Management. 2016. Guidance on the assessment of dust from demolition and construction. Version 1.1. <http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf>



#### 4.2.2.3.3 Assessment Criteria

The main criteria used for the assessment of each route option was adapted from Table 2 (repeated in Table 4.12) of the Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction (June 2016).

**Table 4.12: Sensitivity of the area to dust soiling impacts on people and property**

Number of receptors	Distance from the source (m)		
	<50	<100	<350
> 100	High	Medium	Low
10-100	Medium	Low	Low
1-10	Low	Low	Low

The following scoring was applied:

- Route options with a high sensitivity to dust soiling - Risk Score 3 (moderate risk);
- Route options with a medium sensitivity to dust soiling - Risk Score 2 (low to moderate risk); and
- Route options with a low sensitivity to dust soiling - Risk Score 1 (low risk).

The IAQM dust guidance states that *“for almost all construction activity, the aim should be to prevent significant impacts on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual impact will normally be not significant.”* With the good practice mitigation that would be implemented, which would reduce the maximum risks, a risk score higher than moderate was not considered suitable so a maximum risk score of 3 was adopted.

The overall score for the Option A (Red) was based on the average risk score from each node within the option, taking into account the total length of each option and total number of properties within 300 m of the option.

#### 4.2.2.3.4 Potential Impacts

Construction activities associated with the Proposed Project have the potential to generate fugitive dust emissions. These may give rise to annoyance due to the soiling of surfaces, risk of health effects due to the increase in exposure to fine particulates such as PM<sub>10</sub> and PM<sub>2.5</sub> and damage to vegetation and ecosystems (where very high levels of dust soiling occur).

The main construction activities associated with the Proposed Project that could generate dust include earthworks, trench excavation and material storage. Dust may also be generated by vehicle movements through resuspending dust from haul roads and surfaces. The works associated with the construction of the Proposed Project would be split into several stages, which would involve different periods of earthworks, construction (including setting up compounds and pipeline installation) and trackout<sup>31</sup> and activity levels would not necessarily peak simultaneously. Also, as the works are expected to progress in sections, potential dust generation would only occur for a relatively short period of time at any one location.

Table 4.13 shows the number of receptors, the sensitivity of these to dust soiling and the associated risk score.

<sup>31</sup> The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.

**Table 4.13: Potential Air Quality Impact for Option A (Red)**

No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	Sensitivity of Option to dust soiling	Risk score
433	414	Medium	2

#### 4.2.2.4 Summary of Assessment

For Option A (Red), most of its length is classed as medium sensitivity areas for dust soiling apart from to the west of Clane and around Naas, both areas have a slightly higher receptor count and are classed as high sensitivity areas. Option A (Red) is the longest option and has the second largest number of receptors within 50m of the route. Option A (Red) passes through the southwest of Naas. Option A (Red) runs adjacent to four schools. Option A (Red) crosses over two ecological receptors (Royal Canal pNHA and Grand Canal pNHA (twice)). Therefore, an overall risk score of **Moderate (Dark Green)** has been applied.

**Moderate**

### 4.2.3 Visual

There is the potential for visual impacts at scenic designations, residential dwellings and along public roads, with scenic designations carrying a greater potential for risk.

#### 4.2.3.1 Scenic designations

No designated scenic designations were identified within the portion of the Study Area that occurs within County Meath.

Included in Table 14.4 of Chapter 14 (and indicated on Map 14.2) of the Kildare County Development Plan are '12 "principal landscape sensitivity factors": Major Rivers and Water bodies; Canals; Ridgelines; Green Urban Areas; Broad-Leaved Forestry; Mixed Forestry; Natural Grasslands; Moors and Heathlands; Agricultural Land with Natural Vegetation; Peat Bogs; Scenic View; and Scenic route'. This option will pass within 300m of the following 'principal landscape sensitivity factors' that relate to scenic designations (from north to south):

- Royal Canal View RC11 ('Allen Bridge');
- River Liffey view RL6 ('Millicent Bridge'); and
- Grand Canal view (stone bridge crossing the Grand Canal between the R445 and the R409 regional roads).

##### 4.2.3.1.1 Sensitivity - scenic designations

The sensitivity of these '*principal landscape sensitivity factors*' are recorded in Table 4.7.

##### 4.2.3.1.2 Magnitude of impacts - scenic designations

**Royal Canal View RC11 ('Allen Bridge')**: View from the bridge towards the route is obscured / beyond sight line therefore the likely magnitude of impact is negligible during both the construction and operational phases.

**River Liffey view RL6 ('Millicent Bridge')**: View from the bridge towards the route option is obscured by riparian vegetation on the west bank of the river; therefore, the likely magnitude of impact is negligible during both the construction and operational phases.

**Grand Canal view (stone bridge crossing the Grand Canal between the R445 and the R409 regional roads):** At this section of the route option, the cable will be underground below the regional road, so no change material to the view; therefore, the likely magnitude of impact is deemed to be negligible during both the construction and operational phases.

#### 4.2.3.1.3 Significance of impacts - scenic designations

All the impacts on the '*principal landscape sensitivity factors*' identified are of a negligible magnitude during the construction and operational phase; therefore, all are considered, by default, to have a significance of impact that is Imperceptible.

**Table 4.14: Summary - Principal Landscape Sensitivity Factors within County Kildare – scenic designations**

Principal Landscape Sensitivity Factor	Risk - Direct Impacts (Constraints Study)	Risk – Impacts Within 300m (Constraints Study)	Specific feature	Sensitivity of feature	Likely operational magnitude of impact	Likely operational significance of impact
Scenic View	High	Moderate-High	Royal Canal View RC11 ('Allen Bridge')	High	Negligible	Imperceptible
Scenic View	High	Moderate-High	River Liffey view RL6 ('Millicent Bridge')	High	Negligible	Imperceptible
Scenic View	High	Moderate-High	Grand Canal view (stone bridge crossing the Grand Canal between the R445 and the R409 regional roads)	High	Negligible	Imperceptible

#### 4.2.3.2 Summary of Assessment

The assessment of the potential for significant visual impacts as a result of Option A (Red) can be summarised by the following points:

- There is the potential for visual impacts at residential dwellings and along public roads; and
- Visual impacts on the identified scenic designations are not anticipated to be greater than Negligible during the construction or operational phases, therefore no significant visual impacts are anticipated.

As such, the attributed risk score is **Low-Moderate (Light Green)**.

**Low – Moderate**

## 4.2.4 Amenity

This section outlines the likely impact on the amenity of residential, commercial, and community (and recreational) receptors, collectively, by way of consideration of contributing environmental effects. Issues of access and severance are outlined in Section 4.2.1. All residential, commercial, and community (and recreational) receptors are shown in Figure C.1.1 in Appendix C.1.

The alignment of Option A (Red) passes through both rural and urban areas along its length, as outlined in Section 3.2.1. Table 4.15 lists the known commercial and community receptors that are situated immediately adjacent to the route alignment (this list is not exhaustive but represents a high-level analysis for the purposes of informing the Step 4A selection process). No tourism receptors (i.e. receptors whose main function is aimed at visitors to its locality) were encountered along the alignment of Option A (Red), while one-off or ribboned residential receptors are located along all sections of the route. Option A (Red) is also routed in close proximity or within a number of built-up areas, such as the western edge of Kilcock, the western extent of Rathcoffey village and the western / southern side of Naas.

**Table 4.15: Known Commercial and Community Receptors Adjacent to the Alignment of Option A (Red)**

Commercial receptors:	Community receptors:
Barstown Business Park;	Larchill Arcadian Gardens;
Hatchet Inn (and associated filling station);	Mountpleasant Lodge Nursing Home;
Fordes Superstore (Home Furnishings);	Royal Canal;
Tyre Centre Kilcock;	Millicent Golf Club;
Inver Filling Station;	Naas Sports Centre (and Playground / Skate Park);
Painestown Precast Concrete;	Enable Ireland Kildare Children's Services;
Firmount House;	Naas United Football Club
Kerry Group Global Centre;	Gaelscoil Nás Na Ríogh;
Irish Commercials (and Volvo Trucks);	Piper's Hill Montessori School;
Applegreen Millennium Park;	Piper's Hill College (Secondary School);
ALDI (Naas);	St David's National School
Europcar (Naas);	Killashee National School
Chadwicks Builders Providers;	

Outlined below are details of potential impacts considered likely during the construction of Option A (Red) according to each environmental effect, with a concluding paragraph summing up the overall impact on amenity. Given that the Proposed Project would be underground, there are no operational impacts anticipated on amenity.

Table 4.16 outlines the assessment ratings and associated justifications for each of the contributing environmental effects that, when in-combination, may result in an impact on amenity.

**Table 4.16: Ratings and Associated Justifications for Environmental Effects Contributing to Potential Impact on Amenity**

Air Quality	Noise (and vibration)	Visual	Traffic and Transport
<p>For Option A (Red), most of its length is classed as medium sensitivity areas for dust soiling apart from to the west of Clane and around Naas, both areas have a slightly higher receptor count and are classed as high sensitivity areas. Option A (Red) is the longest option and has the second largest number of receptors within 50m of the route. Option A (Red) passes through the southwest of Naas. Option A (Red) runs adjacent to four schools.</p>	<p>Relatively greater number of noise sensitive receptors impacted compared to other options. Construction noise and vibration impacts temporary in nature, no permanent impacts expected.</p>	<p>(i) Potential for visual impacts at residential dwellings and along public roads. (ii) Visual impacts on the identified scenic designations are not anticipated to be greater than Negligible during the construction or operational phases. No significant visual impacts are anticipated.</p>	<p>Option A (Red) is the longest of the options but also affects the greatest percentage of regional roads of the four options (over 64% - second place is 46%). Disruption to the regional roads will affect more traffic and result in longer diversions. Option A also has the second highest number of properties within 0-50m of its route (433) and so there will be more disruption to access. The number of properties is in part due to the route across Kilcock and through part of Naas. Access will also be disrupted to Larch Hill gardens, Mountpleasant Lodge Nursing Home and five schools (along the R448, south of Naas). Option A (Red) requires the highest amount of HGV diversions with lane closures and relatively low full closures compared to the other options. Same number of key junctions along the route compared to the other options.</p>

In relation to the assigned scoring for potential impacts relating to Air Quality, Noise (and vibration), Visual and Traffic and Transport, it is considered likely that, in a worse-case scenario, there is the potential for considerable but not significant impacts on amenity. Therefore, a risk scoring of **'Moderate (Dark Green)'** has been assigned. For more information in relation to the potential impacts of Option A (Red) in relation to any of these environmental effects, please see Section 4.2.1 to Section 4.2.3.

**Moderate**

## 4.2.5 Health

The Study Area is largely considered to be ‘marginally above average’ in terms of the deprivation indices provided for ‘my Pobal’ (Pobal, 2016<sup>32</sup>), however there are some Electoral Divisions (EDs) within the Study Area which are considered to be ‘affluent’, such as Maynooth, Straffan, Donaghcumper, Naas Rural, Ladytown, and Newtown<sup>33</sup>. According to the Institute of Public Health (in Ireland), people in higher socio-economic groups are at lower risk of chronic conditions and associated disability than those in lower socio-economic groups (Institute of Public Health, 2020).

Using the outcomes of the amenity assessment as reported in Table 4.21, it is considered unlikely that the construction of Option A (Red) would result in significant impacts on human health. This is primarily because processes and activities required during construction of the Proposed Project are temporary in nature, while the nature and scale of the Proposed Project means that construction activity would occur at any one location for a limited time; thereby not significantly impacting human health.

Electromagnetic Fields (EMFs) are considered in this assessment. To ensure EMF levels from electricity cables remain within the safe limits for human health, EirGrid’s design standards require all UGCs to operate within existing public exposure guidelines from the International Commission on Non-Ionising Radiation Protection (ICNIRP), therefore EMFs from UGCs are unlikely to be a cause of public concern for local communities. Such potential impacts are the same for all proposed route options.

See Section 2.3.2 for more details on EMFs.

Given the expected potential impacts a scoring of ‘**Low-Moderate (Light Green)**’ has been assigned for the consideration of potential impacts on Health.

Low - Moderate

## 4.2.6 Employment and Economy

During construction and operation, impacts on employment as well as the national, regional, and local economy are anticipated to be similar among each of the proposed route options given that they are all similar in nature, extent and scale, and located in close proximity to one another within the same Study Area.

There is currently no information on the expected size or composition of the construction workforce required to construct any of the proposed route options, however given the similarities in extent and scale, it is considered that the size and composition of any construction workforce would be broadly the same to construct any of the proposed route options. Such a construction workforce is expected to be at relatively low numbers given the likely scale of works and envisaged construction methodology (i.e. a ‘section-by-section’ piecemeal construction method is expected to be employed). Furthermore, any employment opportunities are expected to be limited given there is considered to be low unemployment within the Study Area at present (the unemployment rate across all key settlement areas within the Study Area is estimated to be 4.5%)(CSO, 2021<sup>34</sup>). It is also likely that skilled workers with particular experience in laying underground cables will be required rather than currently unemployed, unskilled, workers, thereby further reducing the possibility for new employment.

<sup>32</sup> <https://maps.pobal.ie/WebApps/DeprivationIndices/index.html>

<sup>33</sup> <https://publichealth.ie/wp-content/uploads/2020/04/20200416-AGEING-PUBLIC-HEALTH-MAIN.pdf>

<sup>34</sup> <https://cso.maps.arcgis.com/apps/webappviewer/index.html?id=4d19cf7b1251408c99ccde18859ff739>

Due to the aforementioned factors and assumptions, potential impacts on employment during the construction of any of the proposed route options are expected to be positive, albeit limited and not significant. There is expected to be no impact on the labour market during the operation of the Proposed Project given its nature (i.e. underground cables between two unmanned electricity sub-stations).

In respect to potential impacts on the national, regional, and local economy during the construction of any of the proposed route options, these are expected to be positive, limited and not significant. This is due to the expectation that there would be limited economic activity associated with the construction workforce given its small size but also the skilled nature of such employment which is likely to be sourced from outside of the Study Area. Furthermore, given the specialist nature of the equipment being installed, it is likely that most of the capital expenditure would be outside of the Study Area, thereby also limiting supply-chain opportunities.

The operation of the Proposed Project (by way of any of the proposed route options) is expected to have a positive, potentially significant impact on the local, regional and national economies, primarily given its purpose to ensure the security of the electricity supply for consumers which will contribute to the regional economy and support foreign direct investment. The Proposed Project is also expected to provide benefits for local communities, promote sustainability, and stimulate competition in the electricity supply market, as outlined in Section 1.1. These benefits will be achieved regardless of which route option is selected and therefore there is no differentiation as a result.

#### 4.2.6.1.1 Summary of Assessment

Given the expected potential impacts, it is appropriate to assign a score of **'Low (Cream)'** for the consideration of potential impacts on 'Employment and Economy' (applicable to all route options as there is no differentiation).

Low

#### 4.2.6.2 Tourism Sector

Potential impacts on the tourism sector are anticipated to be similar for each of the proposed route options given they are all similar in nature, extent and scale, are located in close proximity to one another, and within the same Study Area.

No tourism receptors were encountered that would be directly impacted by Option A (Red). However there is potential for impacts on such receptors during construction (e.g. disruption to access). These access issues are separately addressed in this report and mitigation measures will be in place to minimise any disruption. There are no direct impacts expected on the tourism sector overall during the construction of any of the proposed route options due to the nature and scale of the Proposed Project.

During operation, there is the potential for positive impacts on the tourism sector, however this would be within the context of positive impacts within the wider local, regional and national economies and would be realised regardless of which route option was identified as the emerging best performing route. As such there is no differentiation between the proposed route options in respect to tourism.

#### 4.2.6.2.1 Summary of Assessment

Given the expected potential impacts, it is appropriate to assign a score of **'Low (Cream)'** for the consideration of potential impacts on 'Tourism Sector' (applicable to all route options as there is no differentiation).

Low



## 4.2.7 Land-use (and Land Take)

Option A (Red) is 51.4km in length, with the majority of the alignment routed along regional and local roads between Woodland substation and Dunstown substation. Some sections of the route alignment are not routed along roadways and are instead aligned across open agricultural land. Approximately 5.9km of Option A (Red) is routed through open greenfield land, largely classed as 'pastures or non-irrigated land' according to 2018 Corine Land Class data. The impacts on agricultural land (including land-take) are considered in Section 4.2.8.

It can be expected that there will be temporary land-take requirements to facilitate the construction of the Proposed Project along the route of Option A (Red). However, it is envisaged that construction activities would proceed on a section-by-section basis, thereby limiting the extent of such land-take requirements to a relatively small area at any one time. Furthermore, given the nature and scale of the Proposed Project, land-take requirements are expected to be minor and, as mentioned above, largely confined to regional and local roads. As such, there is anticipated to be no requirement for land-take from any residential, commercial or community receptors.

### 4.2.7.1 Summary of Assessment

Given the nature of the Proposed Project, there are no impacts on land-use and land take for residential, commercial or community receptors envisaged during the operational phase. Therefore, it is considered appropriate to assign a score of '**Low (Cream)**' for issues relating to land-use (and land-take), for non-agricultural land / receptors.

Low

## 4.2.8 Agriculture (including Equine)

This section addresses potential effects on agricultural land use. Where the construction of the Proposed Project crosses agricultural land there will be direct impacts on agricultural land-use and the operation of individual farms. The permanent land-take will be restricted to locations where inspection booths and other small structures associated with HVAC cable construction may be located. The use of temporary construction compounds located on agricultural land adjoining the works may be required. In general, the permanent land-take requirement will be very low and for the majority of the route crossing agricultural land the impacts will be restricted to soil disturbance and potential compaction due to excavation. This has the potential to affect the quality of the land along the working area and affect land drainage. For the majority of the route the land over the cable will be re-instated after construction is complete and returned to the farmer.

The potential effects of EMF are addressed in Section 2.3.2 of this report.

During the construction period there will be temporary disturbances to the operation of farms. The works area will be temporarily fenced off and this could result in temporary severances of access to fields or farm yards and to water and power supplies (e.g. power supplies to electric fencing and water supplies to water troughs). The excavation works and construction traffic movements have the potential to create noises and movements which may disturb sensitive livestock such as thoroughbred horses. Other potential impacts include the introduction of invasive species and impacts on permanent low input pastures due to disturbance of top-soil. The construction duration will generally be for a period of a few weeks or a few months on most farms. There may be extended periods where alternative construction techniques are required (e.g. directional boring beneath rivers) or where project infrastructure is required. Construction of public utilities such as gas pipelines and water mains on agricultural land is common place in Ireland and with best practice (discussed below) the temporary construction

impacts do not cause significant effects on agriculture. The risk of significant impacts rises with increasing farm enterprise sensitivity and therefore this assessment compares the numbers of high sensitivity enterprises, such as equine and dairy, along each option.

#### **4.2.8.1 Potential Effects on Agriculture from Construction on Public Roads**

Where the construction of the Proposed Project is confined to public roads the impacts on agricultural land-use and the operation of individual farms will be minimal. Farmers (and livestock) use the local road network to access fields and farm yards and for the transportation of livestock and goods. Therefore there will be temporary disturbances to farms located along the route while construction is in progress. This period is likely to be a few weeks or months at any one location. The in-road construction will cross entrances to fields and farm yards, potentially causing temporary disturbance to access. Excavation works and construction traffic movements have the potential to create noises and movements which may disturb sensitive livestock (such as Thoroughbred horses) on lands adjoining the public road. Construction of public utilities in public roads is common place in Ireland and with best practice (discussed below) the temporary impacts do not cause significant effects on agriculture.

#### **4.2.8.2 Best Practices Which Minimise Impacts on Agriculture**

This assessment assumes the implementation of the principle of best practice during the construction and operation of the Proposed Project. Best practices in relation to safety and EMF involve laying the proposed HVAC cable in a concrete type material beneath the field surface. Adherence to this methodology ensures safety of farm machinery operators and livestock. To ensure EMF levels from electricity cables remain within the safe limits for human health, EirGrid's design standards require all UGCs to operate within existing public exposure guidelines from the International Commission on Non-Ionising Radiation Protection (ICNIRP), therefore EMFs from UGCs are unlikely to be a cause of public concern for local communities. Such potential impacts are the same for all proposed route options.

The contractor will engage with all landowners along the route of construction and discuss their requirements for access. The contractor will maintain reasonable access at all times. Reasonable access will respond to the individual needs of farmers and stud farms on a case by case basis. For example it would be essential to allow access for milk lorries into dairy farms whereas, with agreement, it may not be necessary to maintain continuous access to some roadside field gates when alternative access is available through the farmer's land. It may also be reasonable to restrict access to land for a period of time which is agreed in advance with the farmer. The contractor will notify the adjoining landowners in advance when construction noises may occur so that landowners have time to manage sensitive livestock such as thoroughbred horses. The contractor will maintain services such as water and power to ensure livestock have continuous access to water or provide an alternative source where necessary. It is best practice that the contractor provides a key contact person whom landowners can contact on an on-going basis during construction. Agricultural land, land drainage, local roads and affected accesses will be re-instated to pre-works condition. Services will be diverted where necessary should they be impacted by the construction works and access to severed sections of land will be arranged as necessary with landowners during the construction works.

#### **4.2.8.3 Existing Agricultural Land-Use Along Option A (Red)**

The Option A (Red) crosses mineral soils along its entire length avoiding significant areas of peat to the west. From Woodland Substation to Dunstown Substation there are twelve high sensitive enterprises located along Option A (Red) – eight equine enterprises, three dairy enterprises and one horticultural enterprise. Option A (Red) will cross agricultural land for approximately 6km (12% of the entire length) and will cross one high sensitive dairy farm adjoining the Sallins Bypass.

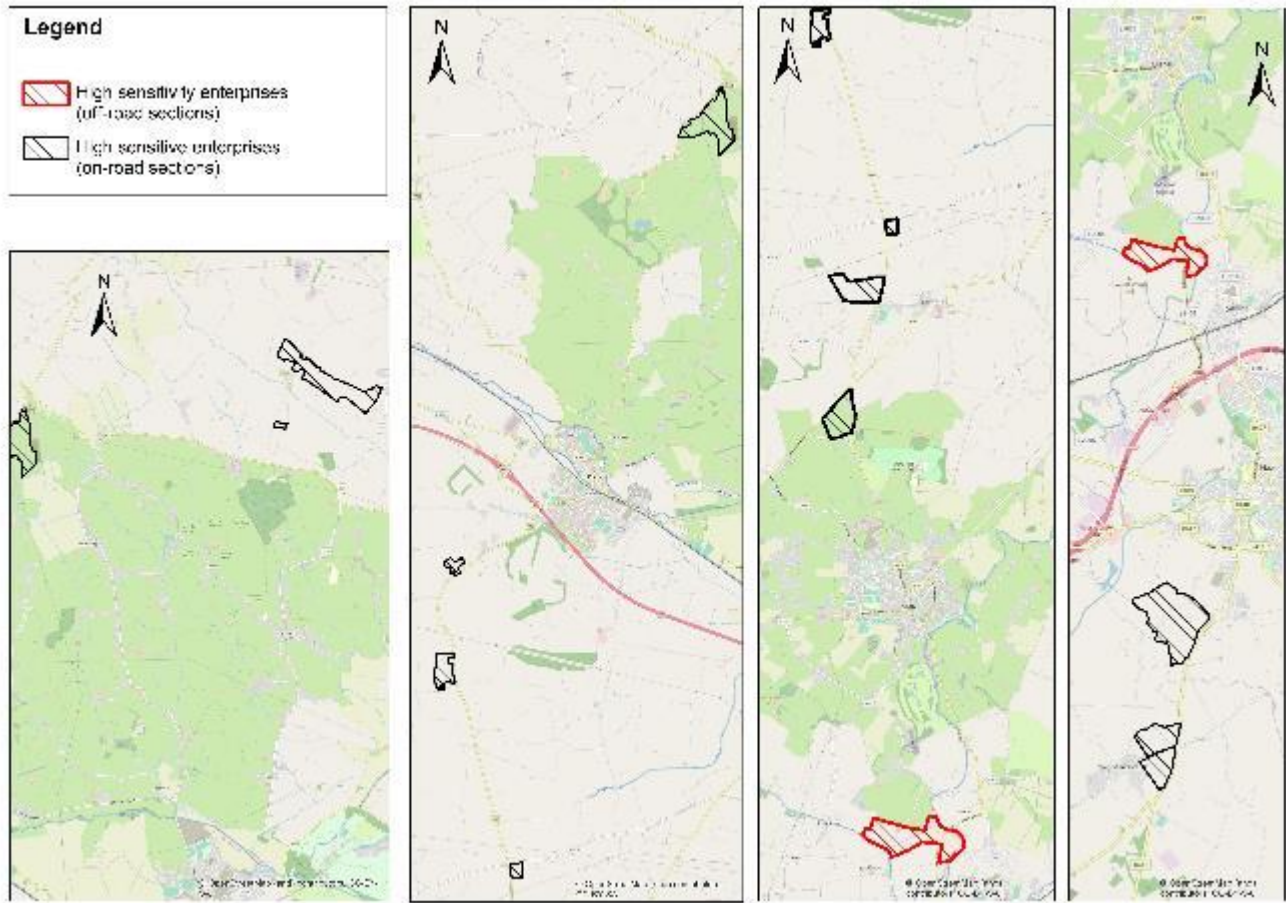


Figure 4-1: High sensitivity enterprises affected by Option A (Red).

#### 4.2.8.4 Summary of Assessment

The ranking score for Option A (Red) is considered to be ‘Low’ (Cream) given the moderate length across agricultural land and the low number of high sensitive enterprises it impacts.

**Low**

## 4.2.9 Utilities

There are numerous underground utilities in the regional road network between Woodland and Dunstown, including other electricity cables; telephone and broadband cables; sewers; and public and private water supplies. The public water supply is extensive in the area, with the network predominately using the road network for local residential supply while other larger mains being located off-road in agricultural land. There is no known group water supply with protected areas within the Study Area.

The assessment of Option A (Red), based on mapping provided by the utility owners, has found that it crosses existing 38kV underground cables (twice), existing fibre cables (nine times), existing medium pressure gas pipelines (28 times), existing water supply network (95 times) and existing wastewater network (16 times). The count of crossing locations includes points within the same roads. For example, Option A meets the medium-pressure gas network in five locations with multiple crossings within these sections. The five locations are at Kilcock; on the R403 (Clane to Prosperous road); Millennium Parkway, R445, and R448 (roads within Naas). However, because of the layout of gas network crossing from one side of the road to the other, it is counted as 28 crossings.

It is expected that all utilities encountered during construction will either remain in-situ or, where absolutely necessary, appropriate diversions or modifications carried out (with the permission of the respective provider) so as to ensure disruption to surrounding communities is kept to an absolute minimum and that any required service disruption will only be permitted for an agreed set period of time per day (generally a set number of hours) and will not be permitted to be continuous for full days at a time. Any required disruptions would be carefully planned so as to ensure that the duration of disruption is minimised in so far as is possible.

### 4.2.9.1 Summary of Assessment

Given the number and type of utility interfaces along the length of Option A (Red), along with the potential for disruption to people and neighbouring communities, it is appropriate to assign a risk score of '**Low-Moderate (Light Green)**'.

**Low-Moderate**

## 4.3 Technical

As set out in Section 2.3.3, the topic areas under consideration to assist with determining the best route option are as follows:

- General Compliance with System Reliability, Security Standards;
- Headroom and Ratings Impact;
- Maintainability;
- Technology Operational Risk;
- Average Reliability Rates; and
- Repeatability.

### 4.3.1 General Compliance with System Reliability, Security Standards

This is EirGrid's reliability and security standards are defined in the Transmission System Security and Planning Standards and their Operation Security Standards.

All technical input to the Kildare Meath project will comply to EirGrid's Standards for Security and Reliability. Therefore, there is no differentiation between the proposed route options and route Option A has been assigned a score of **Low (Cream)**.

Low

### 4.3.2 Headroom and Ratings Impact

Headroom is the amount of additional capacity each route option offers that would be available for the future without requiring further upgrade. All the proposed route options carry little additional headroom (spare current capacity) due to the nature of the corridor therefore giving no technical differentiation between the proposed routes in this aspect.

The current ratings bottleneck is the impact on the overall circuit ratings of the worst-case deepest obstacle crossing. As all the proposed route options will require some deep crossing solutions (below railways, motorways, rivers or a combination) of similar design, these will be the ratings bottleneck of that particular route. The connection spans north to south, whilst major natural and man-made obstacles are east west orientated, therefore all options cross the river Liffey, the railways, the M4, etc;

On account for the potential total number of Horizontal Directional Drills, Option A (Red) has been assigned a score of **Low (Cream)**.

Low

### 4.3.3 Maintainability

This considers the ease with which the route option can be serviced and maintained, for example how easy it is to access joint bays and link boxes.

All the proposed route options will be developed with the same design principles. For example, maximum standing sheath voltages, typical trench cross-section, separation between joint bays, location of link boxes (underground in chambers or pillar mounted), same substation entry locations. Whilst some route options come with a greater proportion of off-road build as opposed to road, with the level of design detail available at this stage, is not possible to substantially differentiate between the proposed route options.

As there is no differentiation between the proposed route options and route Option A has been assigned a score of **Low (Cream)**.

Low

### 4.3.4 Technology Operational Risk

This criterion aims to capture the risk of operating different technologies on the network.

The same technology is applied to all solutions including cables, joint bays, and bonding. All technology will be the standard technology in the industry and also the dominant technology on EirGrid's existing network (i.e. XLPE insulated underground cables). Therefore, there is no differentiation between the proposed route options and route Option A has been assigned a score of **Low (Cream)**.

Low

### 4.3.5 Average Reliability Rates

This is the likelihood of the chosen cable technologies such as cables, joint bays, and bonding failing during operation is low. This is a technical issue, which would not cause any safety issues. All cable technology listed above are common to all route options.

Industry data on Cross-Linked Polyethylene (XLPE) insulation technology indicates that cable failures on a statistical basis are related to cable length in km.

The proposed route options lengths are as per Table 4.17 (all values are based on desktop surveys).

**Table 4.17: Option Length Comparison**

Route Option	Length (km)	% increase over the shortest	Notes
Option A (Red)	51.4	10%	
Option B (Green)	50.4	8%	
Option C (Orange)	46.7	-	This is the reference route
Option D (Blue)	50.5	8%	

The small variation in length (km) between the proposed route options does not trigger any substantial increase in the risk of failure. Furthermore, there is not currently sufficient technical detail, at this point, to determine the number increase of joint bays of each route against the shortest (Option C).

Therefore, there is no discernible differentiation between the differentiation between the proposed route options and route Option A has been assigned a score of **Low (Cream)**.

Low

### 4.3.6 Repeatability

Repeatability is whether the proposed technical solution can be readily repeated in the transmission network.

All the proposed route options will be developed with the same design principles; therefore, all route options are easily repeatable across the transmission network. Therefore, there is no differentiation between the proposed route options and route Option A has been assigned a score of **Low (Cream)**.

Low

## 4.4 Deliverability

### 4.4.1 Design Complexity

There are 13 surface waterbodies crossed along the length of Option A (Red), some of which crossed more than once; therefore there will be 20 crossings in total. These waterbodies will be crossed in a variety of different ways in order to minimise the environmental impacts, and to ensure construction and operational efficiency. Option A (Red) also has the least off-road sections, thus interface with private assets is minimised.

The utilities crossings are assessed in Section 4.2.9 of this report. Option A (Red) meets the medium-pressure gas network in five locations with multiple crossings within these sections. The five locations are at Kilcock; on the R403 (Clane to Prosperous road); Millennium Parkway, R445, and R448 (roads within Naas). Option A (Red) will require six major crossings (such as HDD), which is the same number as Option B (Green) and less than Option C (Orange) and Option D (Blue).

Option A (Red) has been assigned a score of **Low Moderate (Light Green)**.

Low-Moderate

### 4.4.2 Traffic Disturbance

As outlined in the Socio-Economic section, it is anticipated that the road closures will be required where the road does not have sufficient width to accommodate live traffic and the works associated with the construction. Any works along this route will be undertaken during normal daytime working hours with no night-time or weekend working, unless in the case of emergencies. For Option A (Red), it is anticipated that the full road closures might be required at the following locations:



- L6207 from Ribstown through Cullendragh to Barstown junction with the R156, an overall distance of 2,460 meters. In this location the carriageway is between 2.5 and 4.0 meters wide and does not allow adequate space for vehicles to pass the construction works safely;
- R125 from Mullagh Junction with the R156 through to the Balfeghan roundabout, an overall distance of 7,580 meters. At this location, the carriageway is between 4.0 meters and 7.0 meters wide, which will be reduced to 2.0 meters wide once the construction work commences. Once below 2.5 meters wide a full road closure is required. Note, it is anticipated that this might not be required for the full length of the road section; and
- At the end of Option A (Red) from Stephenstown South Junction to the R412 through to the Dunstown Substation, a distance of 1,240 meters has a width of only 3.0 meters. Therefore, the construction works is likely to take up most of the width of the road, thereby requiring a full road closure.

In other areas of Option A (Red), the road width will be reduced to a minimum of 3.0 meters by the proposed construction works. In these areas it is anticipated that a lane closure may be required, with diversions for HGV vehicles:

- Jenkinstown Junction to the Mullagh Junction of the R156 and the R125;
- From the southern M4 crossing to the R408 Junction;
- From Longtown North to the Millicent South Junction; and
- From the R448 Kilcullen Road roundabout at Naas East to the Stephenstown South Junction.

For all the remaining road sections along Option A (Red), the roads may require lane closures with localized traffic management measures to allow the construction works to be carried out, specifically:

- Barstown Junction with R156 to the Jenkinstown Junction;
- Balfeghan R1 Roundabout to the Junction between R158 and R148;
- Sallins Bypass North to the South section;
- From M7 Crossing South to the R409 Ploopluck Roundabout; and
- From the R409 Ploopluck Roundabout to the R448 Kilcullen Road Roundabout.

Table 4.18 provides a high-level summary of the proposed traffic management measure during construction period for Option A (Red). It is recommended that, following selection of the proposed option, a detailed analysis be undertaken with regards to the phasing of road closures.

**Table 4.18: Summary of Option A (Red) Traffic Management**

Option A	Total Length (in km)	Lane Closures (in km)	HGV Diversions (in km)	Road Closures (in km)	Field Crossings (in km)
	51.4	10.9 (21.1%)	24.2 (46.7%)	11.3 (21.8%)	6 (11.6%)

As outlined in the Socio-Economic section, in terms of traffic disturbance, it has been acknowledged that the construction works will impact the private vehicle. A moderate to high-ranking score has been assigned to Option A (Red) based on the level of temporary Traffic Management which is anticipated to be required during the phased construction works. For Option A (Red), full lane or a road closure during the phased construction works ‘with’ or ‘without’ Heavy Goods Vehicles (HGVs), diversions are mostly available while at all times maintaining access for

local residents. On this basis, the significance of the traffic disturbance impact is assessed to be low. Where suitable diversions for through traffic are available along the length of the route option, the average installation rate is anticipated to be 80 meters per day, resulting in a minimum timeline of approximately two years to install this option. The exact location of the cable trench will be defined later in the project and this will depend on further design, surveys, consultation, and assessment. Consultations with the local authorities will help to define where the cable trench will go in the road to minimise disruption. For example, if a safe alternative could be provided for access with significant disruption for pedestrians, a footpath could be used to minimise disruption to the road network.

#### 4.4.2.1 Summary of Assessment

Option A (Red) is anticipated to require mostly HGV diversions for lane closures and less full road closures compared to the other Options B and C with alternative routes for traffic diversion. In terms of traffic disturbance related to the Traffic Management, these measures will Option A (Red) has been assessed as **Moderate-High (Light Blue)**.

Moderate-High

#### 4.4.3 Dependence on Other Infrastructure Projects

As outlined in Chapter 1 of this report, all route options will have the same dependence on works required at the associated substations in terms of connections. In terms of other infrastructure projects in the area, similar crossing of existing motorways, railways and canals are required. All four of the proposed route options will cross the same infrastructure but, in some cases, in different locations. All four route options will cross or run parallel with utilities, including water mains and the low to medium pressure gas network.

All four of the proposed route options will cross the proposed Water Supply Project<sup>35</sup>. This is a water pipeline scheme from the lower River Shannon at Parteen Basin in Co. Tipperary, travelling 170km to a new termination point reservoir at Peamount in South County Dublin. The proposed underground pipeline will cross the Proposed Project Study Area in a west to east direction and so all four route options will cross the pipeline. At the time of writing, the Water Supply Project has not yet been finalised and submitted for planning. However, based on public consultation information, the pipeline will enter the Project Study Area close to Baltracey, halfway between Kilcock and Clane. It travels in a south easterly direction to towards Straffan and exist the Project Study Area to the south of Celbridge. Further design and assessment will be required at the next step of the Proposed project; however, the proposed pipeline can be crossed by the Proposed Project and as all four route options will cross it, it is not considered a differentiator at this point in the Proposed Project.

Option A (Red) could impact the route of the proposed Leinster Orbital Route. This is a proposed motorway linking Drogheda with Navan and Naas and has been discussed for over 20 years. There is no defined route for the motorway and the proposed route is not in the current Transport Strategy for the Greater Dublin Area 2022 – 2042<sup>36</sup>. The route would travel south from Navan along the western edge of the Project Study Area with a connection to the M4 Junction at Kilcock, and then past Prosperous towards Naas and the N7. There are no firm plans for the proposed motorway therefore, it cannot be included in this assessment. Option A (Red) has been assessed as **Low-Moderate (Light Green)** in terms of dependence on other infrastructure projects.

Low-Moderate

<sup>35</sup> <http://www.watersupplyproject.ie/>

<sup>36</sup>National Transport Authority. 2021. Transport Strategy for the Greater Dublin area 2022-2042. <https://www.nationaltransport.ie/gda/>

#### 4.4.4 Permits and Wayleaves

At this stage of the assessment, all route options will have a similar issue with permits. A wayleave is a right of access that will be agreed with an affected landowner and will cover the area of the cable, as well as land required for access and maintenance. The greater the area of off-road sections, the greater the amount of wayleaves that will be required to be negotiated and agreed with landowners. Due to the nature of these legal agreements, typically this can be quite an extended process. The approximate length of off-road sections for the route options are:

- Option A (Red) – 6.0km;
- Option B (Green) – 10.6km;
- Option C (Orange) – 15.5km; and
- Option D (Blue) – 9.0km.

Option A (Red) has the least amount of off-road sections (approximately 6km compared to Option C's 15.5km) and so this will reduce the number of landowners directly affected and reduce the amount of wayleaves required. As such, Option A (Red) has been therefore assessed as **Low-Moderate (Light Green)** for this criterion.

Low-Moderate

#### 4.4.5 Implementation Timelines

This route option requires the least amount of off-road access and the highest amount of lane closures. This will facilitate a reduction in implementation programmes. The reduction in off-road access, will negate the need for extended remediation following construction works i.e. decompaction and re-seeding of agricultural land. The ability to work under lane closure will assist in 'corridor working' and reduce the requirements to manoeuvre construction vehicles through narrow roads.

Option A has therefore been assigned a score of **Low Moderate (Light Green)** for this criterion.

Low-Moderate

#### 4.4.6 Combined Deliverability Performance

Considering the design complexity, traffic disturbance, impact dependence and implementation timelines, a rating of **'Moderate' (Dark Green)** has been assigned. Option A (Red) has generally scored well (Low-Moderate) over all of the Deliverability sub-topics, however the impact in terms of traffic disturbance has elevated the overall score. Option A (Red) has the least amount of off-road section and impacts more regional roads than the other route options, which will increase traffic disturbance.

Moderate

## 4.5 Economic

As set out in Section 2.3.4, the topic areas under consideration to assist with determining the best route option are as follows:

- Length of installed cable;
- Quantity of Minor and Major service crossings; and
- Number of Major Crossings (such as Horizontal Directional Drills).

### 4.5.1 Length of Installed Cable

The first economic assessment is from the overall lengths of the cable routes (see Section 4.3.5). From this, Option A (Red) has a total length of 51.4 km which is 10% longer than the shortest route (Option C (Orange)) and therefore it can be assumed to have 10% more of an economic impact in this aspect.

While this is the longest route out of the proposed options, 10% will not greatly impact the project. For this reason, Option A (Red) has been assigned a score of **Moderate (Dark Green)**.

Moderate

### 4.5.2 Quantity of Crossings

An assessment of both the minor and major crossings expected to be encountered for the cable route options has been carried out by categorising them into the different crossing types (presented in Section 2.3.3.2). Summaries of these are listed below where Type 1 has the lowest impact and Type 4 has the highest.

- Type 1 Crossings - shallow crossings (utility/drainage/other) - deeper installation;
- Type 2 Crossings - shallow water crossings (Likely open cut solution);
- Type 3 Crossings - larger water crossings (Cable bridges/culverts/micro tunnels); and
- Type 4 Crossings - large crossings (Horizontal directional drills/ Auger bores or tunnel solutions).

From our study of the routes, it has been found that route Option A (Red) has the fewest Type 1 crossings, joint most Type 2 crossings, no Type 3 crossings and joint least Type 4. For this reason, route Option A (Red) has been assigned a score of **Low (Cream)**.

Low

## 4.6 Summary of Option A (Red) Assessment

### 4.6.1 Environment Summary

A summary of the environment appraisal of Option A (Red) is provided in Table 4.19. Overall, Option A (Red) has been scored as **Moderate (Dark Green)** in terms of risk of environmental impact. This is due to crossings within the zonings within the Kilcock Environs, Kilcock Town, and Draft Naas LAPs, increased watercourse crossings, and increased cultural heritage effects. This route option is in proximity to the highest number Recorded Monuments (including Jigginstown Castle), Protected Structures, and Gardens and Designed Landscapes.

**Table 4.19: Summary of Environment Assessment for Option A (Red)**

Biodiversity	Soils and Water	Planning Policy and Land Use	Landscape	Archaeology, Architectural Heritage, and Cultural Heritage	Combined Environment Score
Moderate-High	Moderate	Moderate	Low-Moderate	Moderate-High	Moderate

### 4.6.2 Socio-Economic Summary

Option A (Red) has the most significant traffic, transport and access issues and the least significant agricultural land issues. It passes to the west of Kilcock, and through the town of Naas. This increases the social impacts through its proximity to properties and communities. It passes the access to five schools, sports facilities within Naas, Larchill Gardens and a Nursing Home. A summary of the socio-economic appraisal of Option A (Red) is provided in Table 4.20. The combined socio-economic rating for Option A (Red) has been assigned as **'Moderate' (Dark Green)**. Option A (Red) will pass less properties than Option D (Blue) and require less full road closures compared to Options B and C. However because more of its length is in regional roads, construction traffic disturbance will be comparatively greater due to the increased traffic using those roads. While the traffic impacts will be temporary and restricted to the construction phase, in order to minimise the disturbance, traffic surveys will be undertaken to confirm this assumption. Other survey and design work will be completed to confirm the assumptions made on the required working area. In addition, localised route changes could be designed and assessed to minimise impacts further. Consultation will be undertaken with Meath and Kildare County Councils to agree the approach to traffic management and avoid and/or reduce the impacts.

**Table 4.20: Summary of Socio-economic Assessment for Option A (Red)**

Traffic and Transport	Noise and Vibration	Air Quality	Visual	Amenity	Health	Employment and Economy (and Tourism)	Land Use (and Land-take)	Agriculture (including Equine)	Utilities	Combined Socio-economic Score
Moderate-High	Moderate	Moderate	Low-Moderate	Moderate	Low-Moderate	Low	Low	Low	Low-Moderate	Moderate

### 4.6.3 Technical Summary

At this stage in the Proposed Project are there no technical differentiations apart from the number of major crossings. Options A (Red) and B (Green) will have two fewer than Options C (Orange) and D (Blue). Other technical factors will have no impact on the selection of the best performing option. Option A (Red) has been assessed to have a **Low (Cream)** score for the technical criterion.

**Table 4.21: Summary of Technical Assessment for Option A (Red)**

General Compliance	Headroom	Maintainability	Technology Operational Risk	Average Reliability Rates	Repeatability	Combined Technical Score
Low	Low	Low	Low	Low	Low	Low

### 4.6.4 Deliverability Summary

Considering the design complexity, traffic disturbance, impact dependence and implementation timelines, a rating of **'Moderate' (Dark Green)** has been assigned. Option A (Red) has generally scored well (Low-Moderate) over all in the Deliverability sub-topics, however the impact in terms of traffic disturbance has elevated the overall score. Option A (Red) has the least amount of off-road section and impacts more regional roads than the other options, which will increase traffic disturbance. Option A (Red) has the least amount of off-road sections and so this will reduce the number of landowners directly affected and reduce the amount of wayleaves required.

**Table 4.22: Summary of Deliverability Assessment of Option A (Red)**

Design complexity	Traffic disturbance	Dependence on other infrastructure projects	Permits and wayleaves	Implementation Timelines	Combined Deliverability Score
Low-Moderate	Moderate -High	Low-Moderate	Low-Moderate	Low-Moderate	Moderate

### 4.6.5 Economic Summary

At this stage in the Proposed Project, the only differentiations between route options are cable route lengths and the impact from the quantity of expected major crossings. Option A (Red) has been assessed to have a **Low-Moderate (Light Green)** score for the economic criterion due to the fewer major crossings (such as HDDs) balancing out the longer length of the route when compared to the shortest Option C (Orange).

**Table 4.23: Summary of Economic Assessment of Option A (Red)**

Length of Installed Cable	Quantity of Crossings	Combined Economic Score
Moderate	Low	Low-Moderate

## 5. Option B (Green)

This section outlines the assessment of Option B (Green) against the five assessment criteria – Environment; Socio-Economic; Technical; Economic; and Deliverability; and their sub-topics.

### 5.1 Environment

As set out in Section 2.3.1, the 'Environment' criterion assessment topics under consideration to assist with determining the Emerging Best Performing Option are as follows:

- Biodiversity (Flora and Fauna);
- Soils and Water;
- Planning Policy and Land Use;
- Landscape; and
- Archaeology, Architectural Heritage, and Cultural Heritage.

#### 5.1.1 Biodiversity (Flora and Fauna)

##### 5.1.1.1 European Sites

Option B (Green) broadly follows the Option A (Red) route south of Boherhole. Option B (Green) is not located within or adjoined to any European site. The nearest European site is Ballynafagh Bog SAC located approximately 2km to the west of Option B (Green) (Appendix A.1). There is no hydrological or ecological connection to this SAC. Option A (Red) requires the greatest number of river crossings (21) including crossing of watercourses with direct hydrological links to a complex of European sites within Dublin Bay including Rye Water/Cartron SAC (located 3km downstream at the closest point and designated for petrifying springs and two whorl snails), South Dublin Bay and River Tolka Estuary SPA and South Dublin Bay SAC (see Appendix A.1). In the absence of mitigation during construction and depending on crossing methodology there is the potential for impacts to aquatic habitats and species downstream through a pollution event. Habitats along the southern section of Option B (Green) (as with Option A (Red)) are suitable to support foraging qualifying interests bird species from Poulaphouca Reservoir SPA (located 8km east of this route option), and therefore there is potential for disturbance impacts to these species and temporary loss of habitat during construction if undertaken during wintering bird season.

##### 5.1.1.2 National Sites

No NHA sites are located in proximity to this route option. The closest NHA site is Hodgestown Bog NHA located 4km west of Option B (Green). This route option directly crosses the Royal Canal pNHA west of Maynooth and the Grand Canal pNHA on two occasions at Sallins and Naas. HDD accompanied by a rigorous mitigation plan is to be employed at these major crossings and this will minimise or avoid impacts.

##### 5.1.1.3 Watercourses and Aquatic Species

This route option involves the crossing of several major rivers including Rye Water, River Liffey and tributaries of the River Tolka with varying water framework directive (WFD) status's ranging from 'Good' to 'Poor'. There are potentially six major river crossings requiring HDD and twelve smaller rivers and streams requiring other crossing methods such as open cut including the River Liffey, Lyreen River and Rye Water River and tributaries. Open cut may not be possible across salmonid watercourses. The majority of rivers crossed are classified as of Moderate to Poor status under WFD however tributaries of the River Liffey which are crossed are classed as of Good status under the WFD. These rivers host an abundance of aquatic species. The River Liffey supports Atlantic salmon and brown



trout whilst the Rye Water River is known to support minnow, European eel and lamprey sp. and is also a spawning ground for brown trout and salmon. White-clawed crayfish has been recorded at Leixlip within the Rye Water River. Otter have been recorded in all the major watercourses. Several rivers were noted to be suitable to support kingfisher with one bird recorded hunting along the River Liffey during field surveys.

#### 5.1.1.4 Recent Field Survey Data and Desk Based Review

An initial drive over comprising visual assessments and targeted spot checks at static locations of the accessible sections of the option was undertaken on 11<sup>th</sup>, 12<sup>th</sup> and 13<sup>th</sup> of October 2021 to scope for wintering bird surveys. The dominant habitats recorded along Option B include hedgerows, treelines, agricultural grassland, tillage land (predominantly cereal production), amenity grassland and watercourses. Habitats along Option B have the potential to support breeding and wintering bird species including Annex I species and birds included in the amber and red list of Birds of Conservation Concern in Ireland (BoCCI). Snipe which is red-listed in BoCCI and kingfisher and golden plover which are Annex I listed bird species were recorded during visit one of the wintering bird surveys in October 2021. Hen-harrier winter roost surveys commenced in October 2021 west of Option B (Green). No hen harrier was recorded during the surveys. Devil's bit scabious, the food plant of the Annex II and IV listed marsh fritillary butterfly, was recorded near Dunstown substation within Harristown Common.

A search of the National Biodiversity Data Centre records included records for several protected species including common frog, pine marten, common lizard, red squirrel, badger and otter in the vicinity of Option B (Green). As noted above with Option A (Red), a data request submitted to Birdwatch Ireland for Irish Wetland Bird Survey (I-WeBS) data for Poulaphouca Reservoir SPA and any incidental records available for Co. Kildare and Co. Meath was received in October 2021 and showed large numbers of greylag goose, mallard and teal with lower numbers of several other species including whooper swan, wigeon, curlew and lesser black-backed gull previously recorded approximately 8km from Option B. Several incidental records were received mainly for the areas of Friarstown Straffan and Lakelands in Naas including two large aggregations of lapwing and golden plover. A search of the National Biodiversity Data Centre records included records for several protected species including common frog, pine marten, common lizard, red squirrel, badger and otter in the vicinity of Option B (Green).

Given the routing of a considerable proportion of the route option along narrow road networks bordered by hedgerows and treelines there will be a requirement for vegetation removal to accommodate the cable installation. The route option is bounded in parts by species rich hedgerows and mature tree lines and the removal of these has the potential to result in habitat fragmentation and impacts on protected species and wintering and breeding birds through disturbance, habitat loss and pollution during construction. Given the distance of the cable there is a high likelihood that invasive non-native species listed on the Third Schedule of the EC (Birds and Natural Habitats) Regulations will be encountered along the road networks. All lengths of the proposed route option not in the road surface has the potential for impacts on biodiversity.

#### 5.1.1.5 Summary of Assessment

As with Option A (Red), the greatest impacts on biodiversity for Option B (Green) would be during construction, where despite cables primarily being laid in public roads, there is potential (particularly from passing bays and watercourse crossings) for impacts on hedgerows, tree lines and aquatic ecosystems in particular; other habitats and species may also be disturbed or fragmented during the construction phase and effects could be permanent in some cases (e.g. in the event of a permanent off-road maintenance track). This route option involves the greatest number of river crossings. In the absence of mitigation there is the potential for impacts to Rye Water/Carton SAC in the event of a pollution incident during construction.

There is considered to be '**Moderate-High (Light Blue)**' risk of a significant impact to biodiversity due to Option B.

**Moderate-High**

## 5.1.2 Soils and Water

### 5.1.2.1 Geology and Soils

Option B (Green) is underlain predominantly by Carboniferous limestone bedrock, with associated calcareous shales, sandstone in the north and older Silurian greywacke, siltstone and shale in the south of the Study Area. There are no mapped karst landforms or Geological Heritage sites recorded in the vicinity of the route. However, the route crosses rocks in which karst features have been recorded and the potential exists for unmapped features to occur in proximity to the route option. Karst features are associated with the dissolution of limestone and the formation of ground cavities, which may not always be apparent at the surface, with consequent subsidence risks and enhanced subsurface drainage.

Superficial deposits underlying Option B (Green) are predominantly glacial tills, derived from the underlying limestone and, in the north, sandstone and shale bedrock. There is also alluvium associated with watercourses and some limited areas of sand and gravel are crossed by the route option in the southern half of the Study Area.

The route option crosses areas of potential geologic economic deposits (sand and gravel, granular aggregate and crushed rock), predominantly in the south of the Study Area. However, the areas crossed are small and these deposits are widely available in the surrounding area, so this is not considered a significant constraint for route selection.

#### 5.1.2.1.1 Summary of Assessment

The overall evaluation for Option B for geology and soils is ranked as '**Low (Cream)**' risk based on currently available information. However, the potential for unmapped karst features should be noted and further assessment may be needed to identify potential for ground stability issues.

Low

### 5.1.2.2 Groundwater

The majority of Option B (Green) lies within the Dublin (poorly productive bedrock) WFD groundwater body, with a small area in the north within the Moynalvy (poorly productive bedrock) and Dunshaughlin (productive fissured bedrock) groundwater bodies. In the southern half of the Study Area, the route option crosses the Naas (karstic) and Curragh Gravels East (gravel) groundwater bodies.

The majority of the route option is underlain by bedrock classified as Locally Important Aquifer (bedrock which is generally moderately productive in local zones), with a small area of Regionally Important Aquifer - Karstified (diffuse) crossed in the southern half of the Study Area. Some areas classified as of High groundwater vulnerability are crossed by the route option, predominantly in the southern half of the Study Area, along with some very limited areas of Extreme groundwater vulnerability. However, Option B (Green) crosses a smaller total area of higher groundwater vulnerability than Options A (Red) and Option D (Blue). While there are no mapped karst landforms in the vicinity of the route option, it crosses rocks in which karst features have been recorded and the potential exists for unmapped features to occur. Karst features can be associated with significant groundwater flowpaths and may be important in supporting surface water features.

There are no Public & Group Supply Source Protection Areas or Group Water Schemes in the vicinity of the route option. There are a large number of groundwater wells and springs mapped by the Geological Survey Ireland across

the Study Area. However, in accordance with TII guidance<sup>37</sup> and the observation that low yielding wells, used mainly for domestic and farm water supply, are very common in Ireland, the assessment has focused on high-yielding springs and wells used for public water supply and their surrounding protection zones and the total number of wells and springs along each route has not been used in assessing relative impacts at this stage.

No groundwater dependent water bodies or groundwater dependent terrestrial ecosystems (GWDTEs) have been identified at this stage of assessment, so these features have not been used in assessing relative impacts between route options. However, the potential exists for such features to be present within the Study Area and it cannot be conclusively determined at this stage whether or not they may be a constraint for the proposed route.

There is potential for dewatering operations associated with crossings of large watercourses, major roads and railways. This applies to all route options and no specific issues have been identified for Option B at this stage.

#### 5.1.2.2.1 Summary of Assessment

In terms of groundwater the overall evaluation for Option B (Green) is ranked as **Low** risk based on currently available information. However, the potential for unmapped karst features should be noted and further assessment may be needed to identify potential for interference with groundwater flows and potential for groundwater flooding issues.

**Low**

#### 5.1.2.3 Surface Water

There are 13 surface waterbodies crossed by Option B (Green), some crossed more than once. A full list of water bodies and their current status is provided in Table 5.1 as well as their proximity to the Rye Water Valley/Carton SAC, their sensitivity to change, the likely crossing technique to be employed and the potential impacts as a result.

**Table 5.1 Surface Water Bodies Option B (Green)**

Waterbody Name	WFD Status	No. Crossings	Connection & Proximity to Rye Water Valley/Carton SAC (at closest crossing)	Sensitivity	Impact Potential
Liffey_100	Moderate	2	No connection	Medium	Low
Grand Canal Naas Line	Good	1	No connection	Very High	Low
Grand Canal Main Line	Good	1	No connection	Very High	Low
Liffey_120	Good	3	No connection	Very High	Medium
Liffey_130	Good	3	No connection	Very High	Medium
Clonshambo_010	Poor	1	15km	Low	Low
Lyreen_010	Poor	2	7km	Low	Low
Royal Canal Main Line	Good	1	No connection	Very High	Low
Lyreen_020	Poor	2	3.2km	High	Low
Rye Water_020	Moderate	1	3.3km	High	High
Rye Water_030	Moderate	2	4.5km	High	Medium
Dunboyne Stream_010	Moderate	1	No connection	Medium	High
Tolka_020	Poor	1	No connection	Low	High
Total		21			

<sup>37</sup> TII. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes. Unreferenced. Obtained from: [www.tii.ie/technical-services/environment/planning/](http://www.tii.ie/technical-services/environment/planning/) (accessed October 2021). TII guidelines have been used as they are relevant to all linear infrastructure projects.

In addition to water bodies being directly crossed by the cable, for Option B (Green) there are also a number in close proximity which may be at risk from silty water runoff or spillages of hydrocarbons during construction. These water bodies are less than 50m from the route option:

- Liffey\_120: the cable route runs alongside this water body, at approximately 10m from the bank edge, for 375m. The Liffey\_120 is of very high sensitivity and there is a high impact potential from having a trench in such close proximity for this length;
- Liffey\_130: the cable route runs alongside this water body, at between 10m and 30m from the bank edge, for 480m. The Liffey\_130 is of very high sensitivity and there is a high impact potential from having a trench in such close proximity for this length;
- Rye Water\_020: the cable route runs alongside this water body, at approximately 25m from the bank edge, for 140m. The Rye Water\_020 is of high sensitivity and there is a medium to high impact potential from having a trench in such close proximity for this length; and
- Rye Water\_030: the cable route runs alongside this water body, at less than 10m from the bank edge, for 260m. The Rye Water\_030 is of high sensitivity. The cable is being laid within a road in this location, however it is likely that surface water drains will discharge to the water body or that the road is designed for 'over the edge' runoff from the road to the water body. Therefore there is a high impact potential from having a trench in such close proximity for this length.

#### 5.1.2.4 Flood Risk

For Option B (Green), the length (in metres) within a PFRA flood risk area is:

- Pluvial: 844m; and
- Fluvial: 1948m.

There are 21 No. watercourse crossings along the route option; all crossings will be designed so do not present an increase in flood risk, either pluvial or fluvial.

##### 5.1.2.4.1 Summary of Assessment

Considering the number of crossings of water bodies (approximately 21 no.), in particular the crossings of those with high or very high sensitivities, as well as the potential for open cut crossings in addition to potential flood risk, Option B (Green) is scored as **Low-Moderate (Light Green)** in respect to the Soils and Water assessment topic.

**Low-Moderate**

## 5.1.3 Planning Policy and Land Use

### 5.1.3.1 Planning Policy and Legislation

Option B (Green) bypasses Kilcock and passes west of Maynooth, avoiding zoned lands. It follows the same alignment as Option A (Red) from Boherhole until Ploopluck in Naas, avoiding zoned lands in Sallins LAP, where it avoids the town centre and follows and runs parallel with the M7 through Naas South, cutting through Jigginstown and Bluebell before joining the R448 and turning south towards Dunstown station. The following zonings are applicable to Millennium Park, Naas South, Jigginstown and Naas East.

#### 5.1.3.1.1 Draft Naas Local Area Plan 2021-2027

Option B (Green) passes along the western boundary of Naas, interacting with a number of zoned lands, the objectives for which are described within the table below.

**Table 5.2: Relevant Zoning Objectives Naas LAP**

Zoning Objective (Naas Local Area Plan 2021-2027)	
B Existing/Infill Residential	To protect and enhance the amenity of established residential communities and promote sustainable intensification.
E Community & Education	To provide for education, recreation, community and health
F Strategic Open Space	To preserve, provide for and improve recreational amenity, open space and green infrastructure networks.
H Industry and Warehousing	To provide for industry, manufacturing, distribution and warehousing.
H(5) Industry and Warehousing	To provide for industry, manufacturing, distribution and warehousing.
P2 Data Centre/Warehouse	To provide for Data Centre development and their associated infrastructure only.
Q3 Office, Enterprise and Employment	To provide for and facilitate the provision of high job-generating uses.
Q4 Office . Enterprise and Employment	To provide for and facilitate the provision of high job-generating uses.
R Retail/Commercial	To support continued operation of existing commercial uses.

### 5.1.3.2 Planning Applications

A review of all granted and live applications over the last five years within a 50m buffer, 25m either side of Option B (Green), has been performed. Some of these applications will be new receptors which will have already been constructed by the time construction on the Proposed Project commences. These include individual dwellings and larger development as shown in the Local Area Plans.

Of the applications identified in the analysis, the majority were minor residential/domestic in scope, consisting of single dwellings or extensions to existing dwellings. The only other application within the buffer was a commercial proposal located in Farringtons , Rathcoffey in Co. Kildare, which was also minor in scope, consisting of the change of use of a part of the ground floor of a commercial building and internal alterations (Kildare County Council Application no. 191267).

These applications will be taken into account in the routing of the cable. Other larger scale planning applications will also be examined and taken into account within the routing process. Such applications include other energy projects, the Water Supply Project, and road schemes.

### 5.1.3.3 Summary of Assessment

Taking the above into account, Option B (Green) has the least potential to interact with a significant number of recent and current planning applications, and these are all domestic/minor in scope. Furthermore, Option B (Green) has been routed in such a way that it avoids many potential interactions with LAP zonings, only traversing lands zoned within the Draft Naas LAP. It is also acknowledged that with appropriate siting and mitigation, the impacts of these interactions can be further minimised. Therefore, Option B (Green) has been assigned less significant risk in terms of the combined impacts to land use and planning policy, with an overall 'Low' (Cream) scoring.

Low

## 5.1.4 Landscape

### 5.1.4.1 Landscape character

Refer to Section 4.1.4.1 for information on landscape character.

### 5.1.4.2 Landscape elements and scenic designations

No designated or highly sensitive landscape elements were identified within the portion of the Study Area that occurs within County Meath.

Included in Table 14.4 of Chapter 14 (and indicated on Map 14.2) of the Kildare County Development Plan are:

*'12 "principal landscape sensitivity factors": Major Rivers and Water bodies; Canals; Ridgelines; Green Urban Areas; Broad-Leaved Forestry; Mixed Forestry; Natural Grasslands; Moors and Heathlands; Agricultural Land with Natural Vegetation; Peat Bogs; Scenic View; and Scenic route.'*

This option will pass within 300m of the following 'principal landscape sensitivity factors' (from north to south):

- River Liffey; and
- Woodland R412 regional road.

#### 5.1.4.2.1 Sensitivity - landscape elements

The sensitivity of these 'principal landscape sensitivity factors' are recorded in Table 5.3.

#### 5.1.4.2.2 Magnitude of impacts - landscape elements

The magnitude of impacts on landscape elements are as follows:

- **River Liffey:** Approximately 10km of the route passes within an area of 'special sensitivity' that buffers the River Liffey 'principal landscape sensitivity factor'. This area would have a heightened sensitivity to the removal of vegetation. Within this 'principal landscape sensitivity factor' approximately 2.2km of the route occurs within agricultural fields; thus, the construction activity here would be uncharacteristic. For these reasons, the magnitude of impact during the construction phase is deemed to be low. The agricultural land use will be reinstated and the river crossing is likely to be by directional drilling; therefore the likely magnitude of effect during the operational phase is likely to be negligible; and

- **Woodland R412 regional road:** It is likely that the R412 regional road is wide enough to accommodate the trenching work without the need to remove roadside vegetation; therefore, there will be no material change. Thus the magnitude of effect is deemed to be negligible during both the construction and operational phases.

#### 5.1.4.2.3 Significance of impacts - landscape elements

All the impacts on the '*principal landscape sensitivity factors*' identified are of a negligible magnitude during the operational phase; therefore, are considered, by default, to have a significance of impact that is **Imperceptible**. During the construction phase only, the River Liffey '*principal landscape sensitivity factor*' is likely to have a significance of **Slight-Imperceptible**, while for all the others, it will be **Imperceptible**.

**Table 5.3: Summary - Principal Landscape Sensitivity Factors within County Kildare**

Principal Landscape Sensitivity Factor	Specific feature	Sensitivity of feature	Likely operational magnitude of effect	Likely operational significance of effect	
Major Rivers and Water bodies		River Liffey	High-medium	Negligible	Imperceptible
Mixed Forestry		Woodland R412 regional road	High	Negligible	Imperceptible

#### 5.1.4.3 Summary of Assessment

A 10km offline section passes through agricultural fields near the River Liffey '*Principal Landscape Sensitivity Factor*'; therefore, there is a potential for some impact on the landscape character within this area of 'special' sensitivity, but significant impacts are not anticipated. No significant landscape impacts are anticipated. Whilst the magnitude of impact during both construction and operation is at the very bottom end of the magnitude spectrum; some receptors are deemed to have a sensitivity that is at the upper end of the sensitivity spectrum thus a relatively small increase in the magnitude of impact during the construction phase could result in a significant impact therefore the attributed score is **Low-Moderate (Light Green)**.

**Low - Moderate**

### 5.1.5 Archaeology, Architectural Heritage and Cultural Heritage

Option B (Green) includes sections common to Option A (Red), and therefore the receiving environment is similar to that described in Section 4.1.5 above.

A summary of archaeology, architectural heritage, and cultural heritage constraints identified within the Step 3 Study Area is presented in the Environmental Constraints Report along with a discussion on the general character and nature of the constraints present, comprising National Monuments and Preservation Orders, sites on the RHM, Recorded Monuments and sites recorded on the SMR, Protected Structures, structures recorded on the NIAH, ACAs, and GDLs identified by the Survey of Historic Gardens and Designed Landscapes.

Further details for the archaeology, architectural heritage and cultural heritage constraints identified are provided in Appendix B.1.

Option B (Green) is largely located within the existing carriageways of regional and local roads, passing through a number of roadside settlements including Rathcoffey and Moortown along the R408. This option also includes seven offline sections which cross areas of agricultural land in the townlands of Rathasker, Ribstown, Woodland, Moyglare, Timard, Laraghbryan East, Newtown, Crinstown, Longtown North, Curryhills, Cott, Ballynagappagh,



Barretstown, Millicent South, Osberstown, and Jigginstown. While these areas remain largely agricultural, some development is present including the M4 and M7 motorways. This route option crosses the River Lyreen and River Liffey, as well as a number of minor watercourses. The underlying geology is largely limestone, with superficial deposits of till and gravel, as well as alluvium which has the potential to preserve previously unknown archaeological monuments and remains. There is also the potential for votive (religious) offerings in rivers and bogs. Areas of outcropping bedrock have also been noted along the route of Option B (Green).

Baseline information on the archaeology, architectural heritage and cultural heritage constraints identified within 100m of Option B (Green) is provided in Appendix B.1.

### 5.1.5.1 Archaeology

There are no National Monuments, sites with Preservation Orders placed on them, or sites on the RHM located within 100m of Option B (Green).

Three Recorded Monuments are located within 100m of Option B (Green) (see Appendix B.1). These comprise the site of a medieval parish church (AY\_04), a rath (AY\_24), and a mound (AY\_26).

Eight sites recorded on the SMR have been identified within 100m of Option B (Green). These are characterised by the locations of cropmarks (AY\_10, AY\_36, and AY\_46 – 48) and evidence of post-medieval religious activity (AY\_05, AY\_06, and AY\_27).

Further information on the archaeological constraints identified within 100m of Option B (Green) is included in Appendix B.1.

#### 5.1.5.1.1 Archaeological Potential

The underlying geology is largely limestone, with superficial deposits of till and gravel, as well as alluvium which has the potential to preserve previously unknown archaeological monuments and remains. There is also the potential for votive offerings, objects apparently deposited for religious reasons, in bogs and in rivers such as the River Lyreen and River Liffey, as well as in minor watercourses.

### 5.1.5.2 Architectural Heritage

Architectural heritage constraints within 100m of Option B (Green) comprise:

- Six Protected Structures characterised by post-medieval churches (AH\_02, AH\_04, AH\_05, and AH\_12) and houses (AH\_11 and AH\_15)<sup>38</sup>.
- Eight GDLs comprising seven recorded by the Survey of Historic Gardens and Designed Landscapes and one identified from historic mapping (Ordnance Survey 6", 1837 – 1842).

No ACAs are located within 100m of Option B (Green).

Further information on the architectural constraints identified within 100m of Option B (Green) is included in Appendix B.1.

### 5.1.5.3 Cultural Heritage

A total of 27 cultural heritage sites have been identified within 100m of Option B (Green) from the sources identified in Section 2.3.1.5. These are characterised by post-medieval built heritage including houses and farm buildings. Further information on these cultural heritage sites is presented in Appendix B.1.

<sup>38</sup> AH\_04, AH\_05 and AH\_11 are also included on the NIAH and, to avoid double counting constraints, have been included under Protected Structures.

## 5.1.5.4 Potential Impacts

### 5.1.5.4.1 Construction – Direct Impacts

#### Archaeology

No direct impacts have been identified on National Monuments, sites with Preservation Orders, or sites on the RHM as a result of the construction of Option B (Green).

Where Option B (Green) is located within the Zone of Notification associated with a Recorded Monument, this has been identified as a direct impact below. While the option would not directly impact the Recorded Monument itself, excavation of the cable trench and joint bays would have a direct impact on any archaeological remains that may survive within this zone.

Option B (Green) is located within the Zones of Notification of three Recorded Monuments (AY\_04, AY\_24, and AY\_26<sup>39</sup>). Within these zones it is located in the carriageway of existing roads the construction of which is more than likely to have removed or truncated any archaeological remains associated with these monuments that may have been present. However, construction, including the excavation of the cable trench and joint bays would have a direct impact on any archaeological remains that may survive. Construction would also have a direct impact on any archaeological remains associated with these Recorded Monuments that may survive within any additional land take required for construction.

While construction would be within the existing carriageways may have partially removed or truncated any remains associated with, the option has the potential to remove archaeological remains associated with AY\_05 and AY\_46 – 48, construction of Option B (Green) would have a direct impact on any archaeological remains associated with these constraints that may survive. In addition, construction would have a direct impact on any unknown archaeological remains associated with these constraints that may survive within any additional land take required for construction.

The excavation of the cable trench and joint bays would have a direct impact through the removal of any archaeological remains associated with AY\_10 (an enclosure) which is located in an offline section in Laraghbryan East.

Excavation of the cable trench and joint bays, and the excavation of temporary launch and reception pits for directional drilling may also result in a direct impact any previously unknown archaeological remains that may be present within the land required for Option B (Green). The potential for this impact is considered to be higher in previously undeveloped areas than within the existing carriageways, the construction of which is likely to have likely to have removed or truncated any archaeological remains that may have been present.

#### Architectural Heritage

Welds Thatched House (AH\_11), a Protected Structure and assessed by the NIAH to be of Regional importance, and Millicent Church and Lych Gate (AH\_12), a Protected Structure, are located immediately adjacent to Option B (Green). There is therefore potential for a direct impact on these architectural heritage constraints as a result of accidental damage from construction plant.

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<sup>39</sup> Please note, this constraint is also a Protected Structure (RPS B14-07; tumulus); however, given the option is located within the Zone of Notification associated with the Recorded Monument (AY\_26), a direct impact on the monument itself is not predicted and therefore, no direct impact has been identified on the Protected structure.

Should Option B (Green) require additional land take for construction, the removal of boundary features would have a direct impact on seven GDLs (Jenkinstown House; DL\_02, Rodanstown House; DL\_05, Rathcoffey House; DL\_11, Firmount House; DL\_14, Moatfield House; DL\_15, Millicent House; DL\_17, and Killashee House; DL\_20).

### **Cultural Heritage**

One post-medieval road bridge (CH\_01) is located on the existing road through Culcommon. There is therefore potential for a direct impact on this cultural heritage constraint as a result of accidental damage from construction plant.

The excavation of the cable trench and joint bays may have a direct impact through the removal of any surviving remains associated with three cultural heritage sites (CH\_08, CH\_18 and CH\_52). Direct impacts would result from the excavation of the cable trench and joint bays.

CH\_03 is a public house located immediately adjacent Option B (Green). There is therefore potential for a direct impact on this cultural heritage constraint as a result of accidental damage from construction plant.

#### **5.1.5.4.2 Construction - Indirect Impacts**

### **Archaeology**

No indirect impacts have been identified on archaeological constraints as a result of the construction of Option B (Green).

### **Architectural Heritage**

This option is located within 44m of the following five Protected Structures:

- Rodanstown Church (AH\_02);
- Donaghstown Catholic Church (AH\_04; also assessed by the NIAH to be of Regional importance);
- Ballynagappagh (AH\_11; also assessed by the NIAH to be of Regional importance);
- Millicent Church and Lych Gate (AH\_12); and
- Millicent Estate Houses (AH\_15).

While these potential impacts would result from the introduction of noise and visual intrusion into the setting of these constraints during construction from the movement and operation of plant, it is anticipated any intrusion would be temporary (lasting the duration of construction in each location) and, for all constraints except Rodanstown Church (AH\_02), construction activities would be largely screened by established vegetation and intervening built features.

### **Cultural Heritage**

Movement and operation of plant during the construction of Option B (Green) would have an indirect impact on the setting of 13 cultural heritage sites (CH\_03, CH\_09, CH\_28, CH\_30, CH\_31, CH\_37, CH\_43, CH\_46, CH\_54, CH\_55, CH\_57, CH\_58, and CH\_59). However, it is anticipated any intrusion would be temporary (lasting the duration of construction in each location).

### 5.1.5.4.3 Operational Impacts

As the Proposed Project would be located beneath the road surface, and any offline sections would be reinstated after construction no impacts on archaeological, architectural or cultural heritage constraints have been assessed as a result of the operation of Option B (Green).

### 5.1.5.5 Summary of Assessment

While some potential impacts would be comparable to other route options, Option B (Green) would potentially have a direct impact on three Recorded Monuments (one of which is also a Protected Structure). Due to these potential impacts, Option B (Green) has been assigned a risk of **'Moderate (Dark Green)'**.

**Moderate**

A Route Corridor Summary Matrix for archaeology, architectural heritage and cultural heritage is provided in Appendix B.1.

As the project progresses it may be possible to avoid impacts on archaeology, architectural heritage, and cultural heritage constraints through design, including localised realignments of the route. Where impacts on archaeology, architectural heritage, and cultural heritage constraints cannot be avoided it is possible impacts could be reduced through recording in advance of, or during, construction, including the archiving and documentation of the results of this recording for public reference.

## 5.2 Socio-Economic

### 5.2.1 Traffic, Transport and Access

Option B (Green) runs partly through the centre and partly through the western portion of the Study Area, between the Woodland and Dunstown substations. The route option is mainly located along regional and local roads, with offline sections to the west of Maynooth, passing through the settlement of Rathcoffey, and to the west of Clane. The route option then follows the same alignment as Option A (Red) until west of Naas where it splits, avoiding the built-up area of the town before re-joining the alignment of Option A (Red) to the south of Naas.

Table 5.4 presents the break-down of road classifications for Option B (Green).

**Table 5.4: Option B (Green) Road Classification**

Option	Total Length (km)	Road Length Percentage Distribution		
		Regional	Local Roads and Smaller	Off-road and other Land Types
Option B	50.4	38.9	35.9	25.2

Option B (Green) has a similar alignment to Option A (Red) and is mainly located along regional and local roads, although in comparison to Option A (Red), Option B (Green) is running along regional roads for approximately half of its length whereas at least 30% of the route is within local and lower roads. It is noted that the access to the local roads during construction could be challenging for the construction vehicles.

The narrow local roads along Option B (Green) could pose a significant constraint to the use of the public highway to deliver construction materials. In attempting to use these roads, potential impacts include driver and pedestrian delay; increased fear of accidents; and severance effects for local communities and businesses.

It is anticipated that during the installation of cable works, construction would extend through a number of key junctions and roundabouts along Option B (Green), which could have significant impact in traffic disturbance. These sections are also identified in Section 5.4.2. Similar to the route sections there might be a requirement to temporarily divert traffic or restrict certain vehicle movements at these locations. Traffic management measures would be assessed on a case-by-case basis for each signalised junction and standard roundabout. It is noted that the number of the key junctions along Option B (Green) is the highest in comparison to the other potential route options.

Option B (Green) has the third highest number of properties, compared to the other options, within 0 to 50 meters of its centreline – approximately 327 properties.

It is noted that the proposed alignment could potentially impact among the least amount of community assets compared to the other options. In its close proximity it is anticipated that Option B (Green) could impact the access to the St. Joseph's National School in Mulhussey.

### 5.2.1.1 Summary of Assessment

Option B (Green) is within regional roads for 39% of its length, has the third highest number of properties within 50 meters along its route and passes next to only one school (which is less than the other options). This option presents a higher number of key junctions along the route compared to the other options. The use of regional roads will allow less full road closures as regional roads are generally wider and so lane closures with temporary traffic lights/stop-go systems can be put into place. Mitigation measures through consultation and traffic management will reduce the traffic impacts. The measures can include ensuring that the works do not disrupt access to the school and other receptors. Phasing of the works will be important to minimise disruption. This can be done by ensuring that works are completed at less busy times and are carefully planned to avoid road users being disrupted in multiple locations by construction teams in one journey. These measures will be designed at the next step in the Proposed Project. In terms of risk of traffic disruption, the Traffic, Transport and Access (Social) for Option B is assessed to be of **Moderate - High (Light Blue)**.

Moderate - High

## 5.2.2 Noise, Vibration and Air Quality

### 5.2.2.1 Noise and Vibration

#### 5.2.2.1.1 Baseline

Option B (Green) runs partly through the centre of the Study Area and partly through the western portion of the Study Area between the Woodland and Dunstown substations. The route option is mainly located along regional and local roads with offline sections to the west of Maynooth and to the west of Clane. Offline or off-road sections are sections where the route option does not follow alongside a road but cuts across, for example, agricultural land. The route option then runs follows the route of Option A (Red) until west of Naas where it splits, avoiding the built-up area of the town, before re-joining the alignment of Option A (Red) to the south of Naas.

Baseline noise levels are likely to vary along this route option with higher noise levels likely closer to transport infrastructure and during periods of peak transport activity. The main noise source along this route option is from

road traffic noise. Environmental Protection Agency (EPA) traffic noise data for Round 3 contained in EPA Maps<sup>40</sup> shows that traffic noise levels will be highest where the route option crosses the M4 and the M7 and where it runs alongside the R408 and the R448.

EPA railway noise data shows that where the route option crosses the Dublin to Cork railway line rail noise levels are elevated.

### 5.2.2.1.2 Methodology

The noise and vibration assessment at this stage of the Proposed Project involves gaining an appreciation of the baseline noise environment close to each of the proposed route options and identifying noise and vibration sensitive receptors within distance bands up to 300m from each of the proposed routes. Noise impacts from construction activities do not normally occur beyond 300m and vibration impacts do not normally occur beyond 100m. The locations of major crossings where Horizontal Directional Drilling (HDD) is likely to be required and off-road sections where noise impacts are likely to be greater compared to on-road sections is also used to assess each route in terms of the noise risk according to the multi criteria analysis at Step 4A. The risk scale is as follows:

- High: dark blue;
- Moderate-high: blue;
- Moderate: dark green;
- Low-moderate: green; and
- Low: cream.

No baseline noise surveys were undertaken, and no noise modelling was undertaken at this stage of the Proposed Project. However these will be completed at Step 5 of the Proposed Project.

### 5.2.2.1.3 Noise and Vibration Sensitive Receptors

Table 5.5 shows the residential property counts in property counts in distance bands up to 300m from the proposed route. Overall there are a total of 743 sensitive receptors within 300m of the proposed route.

**Table 5.5: Residential Property Counts within 300m of Option B (Green)**

Option	No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	No. of sensitive receptors 100-200m	No. of sensitive receptors 200-300m	Total no. of receptors within 300m
Option B	327	118	175	123	743

As well as residential properties there are other sensitive receptors within 300m of the proposed route which are not included in the above counts including:

- St. Joseph's National School;
- Millicent Golf Club;
- Several equine operations;
- Gaelscoil Nás Na Ríogh School;
- Piper's Hill College;
- St. David's National School; and
- Killashee National School.

<sup>40</sup> <https://gis.epa.ie/EPAMaps/>

#### 5.2.2.1.4 Potential Noise and Vibration Impacts

##### Areas of Potential Horizontal Directional Drilling (HDD)

There is greater potential for adverse noise and/or vibration impacts at sensitive receptors where construction activities would occur over a longer period, e.g. at trenchless crossings. It is recognised that certain construction activities at certain trenchless crossings could be required to take place outside of normal working hours, which would increase the likelihood of adverse noise effects occurring. In addition, certain potential trenchless crossing techniques that may be employed (e.g. HDD) also have the potential to cause adverse vibration effects at nearby receptors.

There is potential for adverse impacts at receptors within 300m of HDD works and there could be six major crossings on Option B (Green). An initial assessment has shown there are the potential for adverse noise impacts at Lyreen\_020, the M4 Motorway, the Dublin-Cork railway line, and the M7 Motorway.

##### Offline Sections

For the majority of the proposed route option, the underground cables are expected to be installed using 'Open Cut' techniques. Where 'Open Cut' works are undertaken adjacent to the existing road network, there is a relatively low potential for temporary impacts due to construction noise. This is due to the relatively high levels of local environmental noise that are typically experienced adjacent to roads. Also, as the works are expected to progress in sections, noise levels at any receptor would only be elevated for a relatively short period of time. However, where 'Open cut' works are undertaken in relatively quiet areas (such as offline sections) close to sensitive receptors there is the potential for temporary impacts due to construction noise.

Table 5.6 shows the total length, the total offline length and whether there are receptors within 300m of the offline route for Option B.

**Table 5.6: Total length and offline length for Option B**

Option	Total Length (km)	Offline Length (km)	Receptors within 300m of offline section
Option B	50.4	10.5	Yes

The table above shows that the route option goes offline for approximately 10.5km of its total length where there is a greater potential to result in adverse noise effects at receptors compared to where works are undertaken adjacent to existing roads.

#### 5.2.2.2 Summary of Assessment

There are relatively small numbers of receptors within 300m of Option B, there is 10.5km of potential offline construction activity and there are receptors within 300m of potential major crossings such as HDDs at six crossing points with the potential to experience adverse noise and/or vibration effects, therefore it is appropriate to give a score of '**Low-Moderate (Light Green)**'.

**Low-Moderate**



### 5.2.2.3 Air Quality

#### 5.2.2.3.1 Baseline

Option B (Green) runs partly through the centre of the Study Area and partly through the western portion of the Study Area between the Woodland and Dunstown substations. The route option is mainly located adjacent to regional and local roads with offline sections (i.e. not adjacent to roads) to the west of Maynooth and to the west of Clane. The route option then runs follows Option A (Red) until west of Naas where it splits from the Option A (Red) route, avoiding the built-up area of the town before re-joining the Option A (Red) route to the south of Naas.

Baseline air pollutant concentrations are likely to vary along this route option. Higher concentrations are likely closer to transport infrastructure and where the route option is closer to larger settlements. The main air quality sources along this route option are from road traffic, particularly where the route option crosses the M4 and the M7.

The Air Quality Index for Health across the Study Area<sup>41</sup> is Good (with an index score ranging from 1-3). The majority of the Study Area, as defined by the EPA<sup>42</sup>, is located within Air Quality Zone D – Rural Ireland apart from locations in Naas, which are within Air Quality Zone C – other cities and large towns.

#### 5.2.2.3.2 Sensitive receptors

Human and ecological receptors are consistent with those listed in Section 4.2.2.3.

The Institute of Air Quality Management (IAQM) dust guidance<sup>43</sup>, has been adapted for the purposes of this assessment. The number of residential properties and schools have been counted and identified as receptors. Table 5.7 shows the human receptor count within 300m of each of Option B (Green).

**Table 5.7: Residential Property Counts within 300m of Option B (Green)**

Option	No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	No. of sensitive receptors 100-200m	No. of sensitive receptors 200-300m	Total no. of receptors within 300m
B	327	118	175	123	743

Overall, there are a total of 743 residential receptors within 300m of Option B (Green).

As well as residential properties there are other sensitive receptors within 300m of the proposed route option which are not included in the above counts including:

- St. Joseph's National School;
- Gaelscoil Nás Na Ríogh School;
- St David's National School;
- Piper's Hill College; and
- Killashee National School.

<sup>41</sup> Environmental Protection Agency (EPA), Air Quality Index for Health, <https://airquality.ie/information/air-quality-index-for-health>, accessed October 2021.

<sup>42</sup> Environmental Protection Agency (EPA), Air Quality Zones, <https://airquality.ie/information/air-quality-zones>, accessed October 2021.

<sup>43</sup> Institute of Air Quality Management. 2016. Guidance on the assessment of dust from demolition and construction. Version 1.1. <http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf>

With regard to ecological receptors, Option B (Green) crosses the Royal Canal pNHA and the Grand Canal pNHA. Therefore, these are in close proximity (i.e. less than 20m) from the route option.

#### 5.2.2.3.3 Assessment Criteria

The main criteria used for the assessment of each option is set out in Section 4.2.2.3.3.

#### 5.2.2.3.4 Potential Impacts

The potential impacts are consistent with those set out in Section 4.2.2.3.4.

Table 5.8 shows the number of receptors, the sensitivity to dust soiling and the risk score.

**Table 5.8: Potential air quality impact for Option B (Green)**

No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	Sensitivity of section to dust soiling	Risk score
327	118	Medium	1.8

For Option B (Green) most of its length is classed as low or medium sensitivity areas apart from around Mulhussey and west of Clane, which have a slightly higher receptor count and are classed as high sensitivity areas.

#### 5.2.2.4 Summary of Assessment

Option B (Green) has the third most receptors within 50m but has higher numbers around Mulhussey and west of Clane. Option B (Green) passes three schools and crosses over two pNHA (Royal Canal pNHA and Grand Canal pNHA (twice)). Therefore, an overall risk score of **Low-Moderate (Light Green)** has been applied.

**Low-Moderate**

### 5.2.3 Visual

There is the potential for visual impacts at scenic designations, residential dwellings and along public roads, with scenic designations carrying a greater potential for risk.

#### 5.2.3.1 Scenic designations

No scenic designations were identified within the portion of the Study Area that occurs within County Meath.

Included in Table 14.4 of Chapter 14 (and indicated on Map 14.2) of the Kildare County Development Plan are:

*'12 "principal landscape sensitivity factors": Major Rivers and Water bodies; Canals; Ridgelines; Green Urban Areas; Broad-Leaved Forestry; Mixed Forestry; Natural Grasslands; Moors and Heathlands; Agricultural Land with Natural Vegetation; Peat Bogs; Scenic View; and Scenic route'.*

This route option will pass within 300m of the following '*principal landscape sensitivity factors*' related to scenic designations (from north to south):

- Royal Canal View RC8 ('Jackson's Bridge' L5041);
- River Liffey view RL6 ('Millicent Bridge'); and

- Grand Canal view GC33 ('Limerick Bridge').

### 5.2.3.1.1 Sensitivity - scenic designations

The sensitivity of these '*principal landscape sensitivity factors*' are recorded in Table 5.3.

### 5.2.3.1.2 Magnitude of impacts - scenic designations

**Royal Canal View RC8 ('Jackson's Bridge' L5041):** There is a direct line of sight from the bridge towards the canal crossing point of this route option c.300m away, but there is an existing high voltage overhead line crossing the canal at c.150m so the view is already characterised by infrastructure. Construction activity is likely to be visible from this bridge; therefore, the magnitude of impact during the construction phase is deemed to be low, but during the operational phase, it is deemed to be low-negligible as a crossing such as a cable bridge (to be determined at next step of the project) may be visible.

**River Liffey view RL6 ('Millicent Bridge'):** View from the bridge towards the route option is obscured by riparian vegetation on the west bank of the river; therefore, the likely magnitude of impact is negligible during both the construction and operational phases (assuming riparian vegetation along the west bank of the River Liffey is to be retained, and protected by a Root Protection Zone during construction).

Grand Canal view GC33 ('Limerick Bridge'): This bridge is heavily visually enclosed by vegetative screening; therefore, the likely magnitude of impact is deemed to be negligible during both the construction and operational phases.

### 5.2.3.1.3 Significance of impacts - scenic designations

The impacts identified on Royal Canal View RC8 ('Jackson's Bridge' L5041) are of a low magnitude during the construction phase. The impacts identified during the operational phase are low-negligible therefore is considered, by default, to have a significance of effect that is **Slight**. The impacts identified on River Liffey view RL6 ('Millicent Bridge') and Grand Canal view GC33 ('Limerick Bridge') are of a negligible magnitude during the construction and operational phase; therefore, all are considered, by default, to have a significance of impact that is **Imperceptible**.

**Table 5.9: Summary - Principal Landscape Sensitivity Factors within County Kildare – scenic designations**

Principal Landscape Sensitivity Factor	Risk - Direct Impacts (Constraints Study)	Risk – Impacts Within 300m (Constraints Study)	Specific feature	Sensitivity of feature	Likely operational magnitude of effect	Likely operational significance of effect
Scenic View	High	Moderate-High	Royal Canal View RC8 ('Jackson's Bridge' L5041)	High	Low-Negligible	Slight
Scenic View	High	Moderate-High	River Liffey view RL6 ('Millicent Bridge')	High	Negligible	Imperceptible
Scenic View	High	Moderate-High	Grand Canal view GC33 ('Limerick Bridge')	High	Negligible	Imperceptible

### 5.2.3.2 Summary of Assessment

The assessment of the potential or significant visual impacts as a result of Option B (Green) can be summarised by the following points:

- Potential for visual impacts at residential dwellings and along public roads;
- Potential visual impacts at Royal Canal View RC8 ('Jackson's Bridge' L5041) during construction and operational phases, but the magnitude of the impact is not likely to be greater than Low, therefore no significant visual impacts are anticipated.

As such, the attributed score is **Low-Moderate (Light Green)**.

**Low - Moderate**

## 5.2.4 Amenity

This section outlines the likely impact on the amenity of residential, commercial, community (and recreational), and tourism receptors, collectively, by way of consideration of contributing environmental effects. Issues of access and severance are outlined in Section 5.2.1. All residential, commercial, and community (and recreational) receptors are shown in Figure C.1.2 in Appendix C.1.

The alignment of Option B (Green) passes through both rural and urban areas along its length, as outlined in Section 3.2.2. Table 5.10 lists the known commercial and community receptors that are situated immediately adjacent to the route alignment (this list is not exhaustive but represents a high-level analysis for the purposes of informing the Step 4A selection process). No tourism receptors (i.e. receptors whose main function is aimed at visitors to its locality) were encountered along the alignment of Option B (Green), while one-off or ribboned residential receptors are located along all sections of the route (outwith off-line sections). Option B (Green) is also routed in close proximity or within a number of built-up areas, such as directly through the centre of Rathcoffey village and the western side of Naas.

**Table 5.10: Known Commercial and Community Receptors Adjacent to the Alignment of Option B (Green)**

Commercial receptors:	Community receptors:
Barstown Business Park;	St Joseph's National School;
Hatchet Inn (and associated filling station);	Royal Canal;
Robinson Farm Agrifoods;	Millicent Golf Club;
Farrington's Mill Restaurant;	Gaelscoil Nás Na Riogh;
Glanbia Agrifoods;	Piper's Hill Montessori School;
Firmount House;	Piper's Hill College (Secondary School);
Kerry Group Global Centre;	St David's National School
Irish Commercials (and Volvo Trucks);	Killashee National School
Applegreen Millennium Park;	
LIDL (Naas)	

Outlined below are details of potential impacts considered likely during the construction of Option B (Green) according to each environmental effect, with a concluding paragraph summing up the overall impact on amenity. Given that the Proposed Project would be underground, there are no operational impacts anticipated on amenity.

Table 5.11 outlines the assessment ratings and associated justifications for each of the contributing environmental effects that, when in-combination, may result in an impact on amenity.

**Table 5.11: Ratings and Associated Justifications for Environmental Effects Contributing to Potential Impact on Amenity**

Air Quality	Noise (and vibration)	Visual	Traffic and Transport
<p>Option B (Green) has the third most receptors within 50m but has higher numbers around Mulhussey and west of Clane. For Option B (Green) most of its length is classed as low or medium sensitivity areas apart from around Mulhussey and west of Clane, which have a slightly higher receptor count and are classed as high sensitivity areas. The option has five schools within 300m.</p>	<p>Relatively fewer noise sensitive receptors impacted compared to other options. Construction noise and vibration impacts temporary in nature, no permanent impacts expected.</p>	<p>(i) Potential for visual impacts at residential dwellings and along public roads.(ii) Potential visual impacts at Royal Canal View RC8 ('Jackson's Bridge' L5041) during construction and operational phases, but the magnitude of the impact is not likely to be greater Low. No significant visual impacts are anticipated.</p>	<p>Option B (Green) is within regional roads for approximately 39% of its length. It requires more full closures than Route A and D with a few options for traffic diversion. Higher number of key junctions along the route compared to the other options. It has the third highest number of properties within 0-50m (327) and will heavily disrupt traffic and access with Rathcoffey. It passes the access to St. Joseph's National School in Mulhussey.</p>

#### 5.2.4.1 Summary of Assessment

In relation to the assigned scoring for potential effects relating to Air Quality, Noise (and vibration), Visual and Traffic and Transport, it is considered likely that, in a worse-case scenario, there is the potential for considerable but not significant impacts on amenity. Therefore, a scoring of **Moderate (Dark Green)** has been assigned. For more information in relation to the potential impacts of Option B (Blue) in relation to any of these environmental effects, please see Section 5.2.1 to Section 5.2.3.

**Moderate**

#### 5.2.5 Health

The Study Area is largely considered to be 'marginally above average' in terms of the deprivation indices provided for my Pobal (Pobal, 2016<sup>44</sup>), however there are some Electoral Divisions (EDs) within the Study Area are considered to be 'affluent', such as Maynooth, Straffan, Donaghcumper, Naas Rural, Ladytown, and Newtown. According to the Institute of Public Health (in Ireland), people in higher socio-economic groups are at lower risk of chronic conditions and associated disability than those in lower socio-economic groups (Institute of Public Health, 2020<sup>45</sup>).

Using the outcomes of the amenity assessment as reported in Table 5.11, it is considered unlikely that the construction of Option B (Green) would result in significant impacts on human health. This is primarily because processes and activities required during construction of the Proposed Project are temporary in nature, while the nature and scale of the Proposed Project means that construction activity would occur at any one location for a limited time; thereby not significantly impacting human health.

<sup>44</sup> <https://maps.pobal.ie/WebApps/DeprivationIndices/index.html>

<sup>45</sup> <https://publichealth.ie/wp-content/uploads/2020/04/20200416-AGEING-PUBLIC-HEALTH-MAIN.pdf>

### 5.2.5.1 Summary of Assessment

In light of the above findings, a scoring of '**Low (Cream)**' has been assigned for the consideration of potential impacts on Human Health.

Low

## 5.2.6 Employment and Economy

During construction and operation, potential impacts on employment and the national, regional and local economy are anticipated to be similar among each of the proposed route options given that they are all similar in nature, extent and scale, are located in close proximity to one another, and within the same Study Area.

The potential impacts on employment and the national, regional and local economy are the same as that outlined in Section 4.2.6.

### 5.2.6.1 Impacts on the Tourism Sector

Similarly to the potential impacts on employment and the national, regional and local economy, potential impacts on the tourism sector are anticipated to be similar among each of the proposed route options given they are all similar in nature, extent and scale, are located in close proximity to one another, and within the same Study Area.

The potential impacts on the tourism sector are the same as that outlined in Section 4.2.6.2.

## 5.2.7 Land-use (and Land Take)

Option B (Green) is 50.4km in length, with the vast majority of its alignment being routed along regional and local roads between Woodland substation and Dunstown substation. Some sections of the route alignment are not routed along roadways however and are instead aligned across open agricultural land. Approximately 10.5km of Option B (Green) is routed through open greenfield land, largely classed as 'pastures or non-irrigated land' according to 2018 Corine Land Class data. The impacts on agricultural land (including land-take) are considered in Section 5.2.8.

Given the similarities around construction methodology and subsequent land-take requirements in respect to people and communities, the potential impacts in regard to land-use (and land-take) are the same as those outlined in Section 4.2.7 and thereby assigned a similar rating of '**Low (Cream)**'.

Low

## 5.2.8 Agriculture (including Equine)

The potential impacts on agriculture are addressed in general in Section 4.2.8. This Section addresses the impacts of Option B (Green).

The Option B (Green) crosses mineral soils along its entire length avoiding significant areas of peat to the west. From Woodland Substation to Dunstown Substation there are sixteen high sensitive enterprises located along



Option B (Green) – thirteen equine enterprises, three dairy enterprises and one horticultural enterprise. Option B (Green) will cross agricultural land for approximately 10.6km (21% of the entire length) and will cross one high sensitivity dairy farm adjoining the Sallins Bypass, the north east part of one very high sensitive stud farm in Rathasker and the centre of one very high sensitive stud farm in Moyglare.

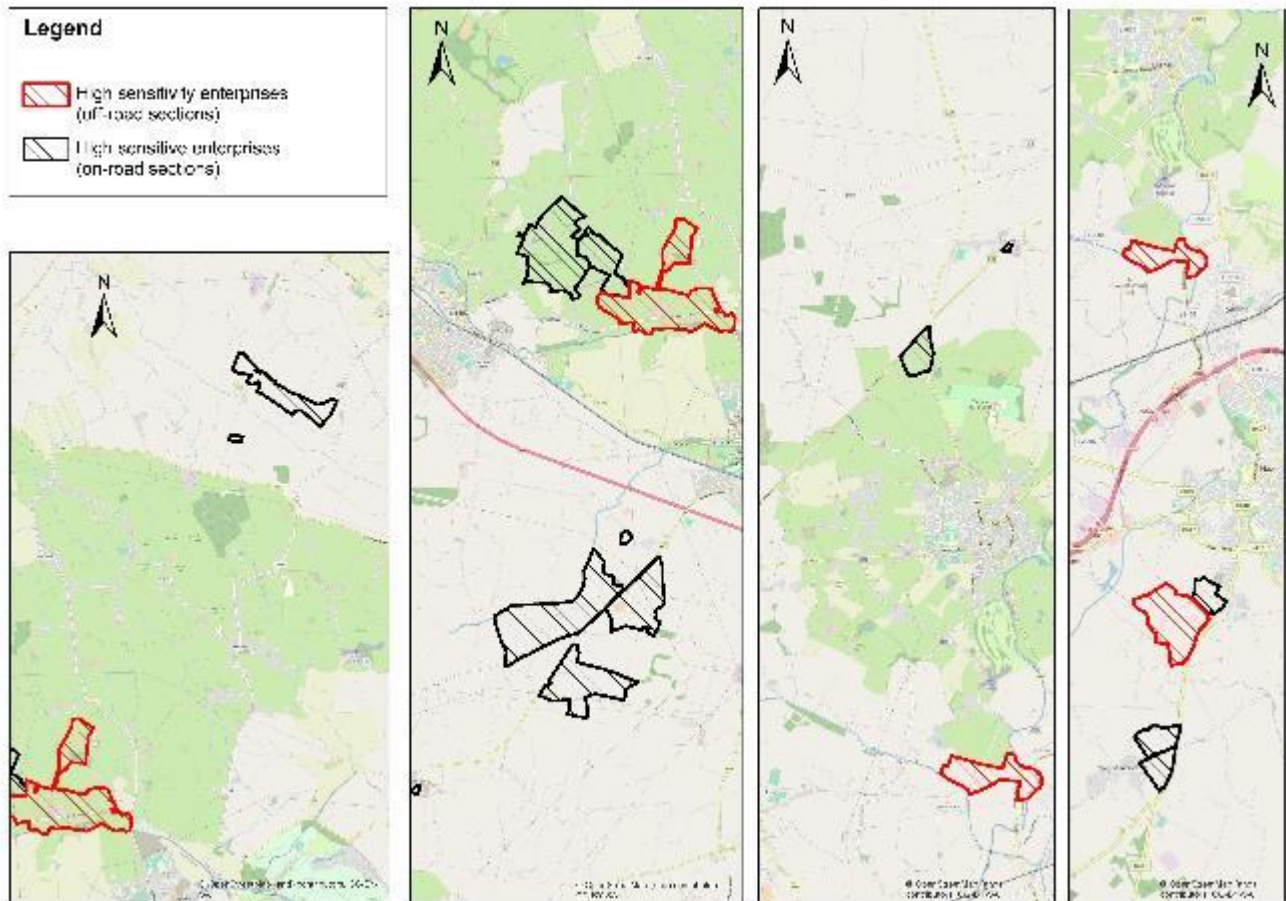


Figure 5-1: High sensitivity enterprises affected by Option B (Green)

### 5.2.8.1 Summary of Assessment

The ranking score for Option B (Green) is considered to be ‘**Low-Moderate**’ given the moderate length across agricultural land and the low-moderate number of high sensitive enterprises it impacts.

**Low-Moderate**



## 5.2.9 Utilities

There are numerous underground utilities in the regional road network between Woodland and Dunstown, including other electricity cables; telephone and broadband cables; sewers; and public and private water supplies. The public water supply is extensive in the area, with the network predominately using the road network for local residential supply while other larger mains being located off-road in agricultural land. There is no known group water supply with protected areas within the Study Area.

The assessment of Option B (Green) has found that it crosses existing fibre cables (twice), existing medium pressure gas pipelines (eight times), existing water supply network (62 times) and existing wastewater network (five times). The counts of crossing locations include points within the same roads. For example, Option B (Green) meets the medium-pressure gas network in five locations with multiple crossings within these sections. The four locations are at R148 (Kilcock to Maynooth); on the R403 (Clane to Prosperous road); Millennium Parkway, R445, and R448 (roads within Naas). The crossing through the settlement of Rathcoffey will also increase the complexity due to the number of services, access, and dwellings. However, because of the layout of gas network crossing from one side of the road to the other, it is counted as eight crossings.

It is expected that all utilities encountered during construction will either remain in-situ or, where absolutely necessary, appropriate diversions or modifications carried out (with the permission of the respective provider) so as to ensure disruption to surrounding communities is kept to a minimum. Any required service disruption will only be permitted for an agreed set period of time per day (generally a set number of hours) and will not be permitted to be continuous for full days at a time. Any required disruptions will be carefully planned so as to ensure that the duration of disruption is minimised in so far as is possible.

### 5.2.9.1 Summary of Assessment

Given the number of utility interfaces along the length of Option B (Green), along with the potential for disruption to people and neighbouring communities, it is appropriate to assign a score of '**Low-Moderate (Light Green)**'.

**Low-Moderate**

## 5.3 Technical

As set out in Section 2.3.3, the topic areas under consideration to assist with determining the best route option are as follows:

- General Compliance with System Reliability, Security Standards;
- Headroom;
- Maintainability;
- Technology Operational Risk;
- Average Reliability Rates; and
- Repeatability.

### 5.3.1 General Compliance with System Reliability, Security Standards

This is EirGrid's reliability and security standards are defined in the Transmission System Security and Planning Standards and their Operation Security Standards.

All technical input to the Proposed Project will comply to EirGrid's Standards for Security and Reliability. Therefore, there is no differentiation between the proposed route options and route Option B has been assigned a score of **'Low (Cream)'**.

Low

### 5.3.2 Headroom and Ratings Impact

Headroom is the amount of additional capacity each route option offers that would be available for the future without requiring further upgrade. All the proposed route options carry little additional headroom (spare current capacity) due to the nature of the corridor therefore giving no technical differentiation between the proposed routes in this aspect.

The current ratings bottleneck is the impact on the overall circuit ratings of the worst-case deepest obstacle crossing. As all the proposed route options will require some deep crossing solutions (below railways, motorways, rivers or a combination) of similar design, these will be the ratings bottleneck of that particular route. The connection spans north to south, whilst major natural and man-made obstacles are east west orientated, therefore all options cross the river Liffey, the railways, the M4, etc;

On account for the potential total number of Horizontal Directional Drills, Option B (Green) has been assigned a score of **Low (Cream)**.

Low

### 5.3.3 Maintainability

This considers the ease with which the route option can be serviced and maintained, for example how easy it is to access joint bays and link boxes.

All the proposed route options will be developed with the same design principles. For example, maximum standing sheath voltages, typical trench cross-section, separation between joint bays, location of link boxes (underground in chambers or pillar mounted), same substation entry locations. Whilst some route options come with a greater proportion of off-road build as opposed to road, with the level of design detail available at this stage, is not possible to substantially differentiate between the proposed route options.

As there is no differentiation between the proposed route options and route Option B has been assigned a score of **'Low (Cream)'**.

Low

### 5.3.4 Technology Operational Risk

This criterion aims to capture the risk of operating different technologies on the network.

The same technology is applied to all solutions including cables, joint bays, and bonding. All technology will be the standard technology in the industry and also the dominant technology on EirGrid's existing network (i.e. XLPE insulated underground cables). Therefore, there is no differentiation between the proposed route options and route Option B (Green) has been assigned a score of '**Low (Cream)**'.

Low

### 5.3.5 Average Reliability Rates

This is the likelihood of the chosen cable technologies such as cables, joint bays, and bonding failing during operation. All cable technology listed above are common to all route options.

Industry data on Cross-Linked Polyethylene (XLPE) insulation technology indicates that cable failures on a statistical basis are related to cable length.

The proposed route options lengths are as per Table 4.17, Section 4.3.5 (all values are based on desktop surveys).

The small percentage difference between the lengths of the proposed route options does not trigger any substantial increase in the risk of failure. Furthermore, there is not currently sufficient technical detail, at this point, to determine the number increase of joint bays of each route against the shortest (Option C).

Therefore, there is no discernible differentiation between the solutions and route Option B (Green) has been assigned a score of '**Low (Cream)**'.

Low

### 5.3.6 Repeatability

Repeatability is whether the proposed technical solution can be readily repeated in the transmission network.

All the proposed route options will be developed with the same design principles; therefore, all route options are easily repeatable across the transmission network. Therefore, there is no differentiation between the proposed route options and route Option B has been assigned a score of '**Low (Cream)**'.

Low

## 5.4 Deliverability

### 5.4.1 Design Complexity

There are 13 surface waterbodies crossed along the length of Option B (Green), some of which are crossed more than once; therefore there will be 21 crossings in total. These waterbodies will be crossed in a variety of different ways in order to minimise the environmental impacts, and to ensure construction and operational efficiency. Option B (Green) also has the second most amount of off-road sections (10.5km approximately), thus interface with private assets is increased.

The utilities crossings are assessed in Section 5.2.9 of this report. Option B (Green) meets the medium-pressure gas network in five locations with multiple crossings within these sections. The four locations are at R148 (Kilcock to Maynooth); on the R403 (Clane to Prosperous road); Millennium Parkway, R445, and R448 (roads within Naas). The crossing through the settlement of Rathcoffey will also increase the complexity due to the number of services, access, and dwellings. Option B (Green) will require six major crossings (such as HDD), which is the same number as Option A (Red) and less than Options C (Orange) and D (Blue).

Option B (Green) has been assigned a score of **Moderate (Dark Green)**.

Moderate

### 5.4.2 Traffic Disturbance

Option B (Green) is very similar to Option A (Red) but differs in the section between the R156 to the north of the Clane. Where Option B (Green) follows the road network, it is anticipated that full road closures might be required at the following locations:

- L6207 from Ribstown through Cullendragh to Barstown Junction with the R156 an overall distance of 2,460 meters. In this location the carriageway is between 2.5 and 4.0 meters wide and does not allow adequate space for vehicles to pass the construction works safely;
- R125 from Mullagh Junction with the R156 through to the Balfeaghan roundabout, an overall distance of 7,580 meters. At this location, the carriageway is between 4.0 meters and 7.0 meters wide which will be reduced to 2.0 meters wide once the construction work commences. Once below 2.5 meters wide a full road closure is required. Note, it is accepted that this might not be required for the full length;
- Moyglare Stud Farm to Moyglare Road Junction, an overall distance of 225 meters. In this location the carriageway is between 2.5 and 3.0 meters wide. Therefore, there is insufficient space for vehicles to safely pass;
- From Timard to Laraghbryan West is a section of road that is 1,170 meters long that is sandwiched between the option running across fields. In this section the road is between 2.5 and 3.5 meters wide and it is expected the construction works to take up all this width of road;
- From Crinstown to the R408 Junction with the L5042, a distance of 1,015 meters. The road width is between 3.0 and 5.5 meters. Once the construction works commences this may leave not space for traffic to pass safely; and
- At the end of Option B from the Stephenstown South Junction the R412 through to the Dunstown Substation including turn off, a distance of 1,240 meters. Here the road has a width of 3.0 meters before any construction works commences and it is expected the construction works will take up most of the width of the road, therefore requiring a full road closure.

In other areas of Option B (Green), the road width will be reduced to a minimum of 3.0 meters by the proposed construction works. In these areas it is anticipated that there might require a lane closure with diversions for HGV vehicles:

- R408 Junction at Crinstown to the Junction of the R408.

All the remaining roads along Option B (Green) might require lane closures with the correct traffic management in place to allow the construction works to be carried out, specifically:

- From Barstown Junction with the R156 to the Jenkinstown Junction;
- From Jenkinstown Junction to the Mulhussey Junction adjacent to castle;
- From Sallins Bypass from North to South;
- At M7 crossing South to the R409 Ploopluck roundabout; and
- From the R409 Ploopluck roundabout to the Southern Link Business Park roundabout.

Table 5.12 below provides a high-level summary on the proposed traffic management plans during installation for Option B (Green). It is recommended that following the selection of the proposed route option, a detailed analysis to be undertaken with regards to phasing of road closures.

**Table 5.12: Summary of Option B Traffic Management**

Option B	Total Length (in km)	Lane Closures (in km)	HGV Diversions (in km)	Road Closures (in km)	Field Crossings (in km)
	50.4	10 (20%)	11.2 (22.4%)	14.7 (29.3%)	10.6 (21%)

In terms of traffic disturbance, a Moderate score has been assigned to Option B (Green) based on the Traffic Management which is anticipated to be required during construction works.

For the Option B (Green), in each section requiring a lane closure 'with' or 'without' HGV, diversions are mostly available while at all times maintaining access for local residents. It is anticipated though that few road sections are likely to require full closure and there may not be suitable diversions for the through traffic along the length of the option.

Where suitable diversions for through traffic are available along the length of the route, the average installation rate is anticipated to be 80 meters per day, resulting in approximately two years to install this route option.

The exact location of the cable trench will be defined later in the project and this will depend on further design, surveys, consultation, and assessment. Consultations with the local authorities will help to define where the cable trench will go in the road to minimise disruption. For example, if a safe alternative could be provided for access with significant disruption for pedestrians, a footpath could be used to minimise disruption to the road network.

Option B (Green) follows a similar alignment to Option A (Red) but differs in the section between the R156 to the North of Clane, located along local roads and fields. It requires more full closures than Option A (Red) and Option D (Blue) with a few options for traffic diversion. In terms of traffic disturbance related to the Traffic Management, Option B (Green) has been assessed as **Moderate (Dark Green)**.

**Moderate**

### 5.4.3 Dependence on Other Infrastructure Projects

As outlined in Chapter 1 of this report, all route options will have the same dependence on works required at the associated substations in terms of connections. In terms of other infrastructure projects in the area, similar crossing of existing motorways, railways and canals are required. All four of the proposed route options will cross the same infrastructure but, in some cases, in different locations. All four route options will cross or run parallel with utilities, including water mains and the low to medium pressure gas network.

All four of the proposed route options will cross the proposed Water Supply Project<sup>46</sup> and therefore it is not considered a differentiator as outlined in Section 4.4.3.

Option B (Green), Option C (Orange), and Option D (Blue) will cross the proposed DART+ West railway line at the crossing point of the Dublin Sligo railway line. This project proposes the electrification and re-signalling of the Maynooth line and construction of a new DART depot facility west of Maynooth for the maintenance and parking of trains. West of Maynooth, the rail track will be upgraded to a twin-track between Maynooth and the proposed depot. This twin track configuration will divert offline to the south, running parallel to the existing railway on the approach to the proposed depot. The planning application is expected to be made to An Bord Pleanála in 2022, with construction possible in 2025. At this location, it is proposed that Options B (Green), Option C (Orange), and Option D (Blue) will cross the existing railway line with a major crossing (such as HDD). The proposed DART+ West project will require a long crossing and additional studies and shielding to ensure that there are no electro-magnetic forces issues between the Kildare-Meath Grid Upgrade project and the electrified line.

At this stage, it is not considered that there would be any conflicts between the two projects and both could be constructed without significant constraint. It is possible that both projects would be at construction at the same time and additional consideration would be needed to the cumulative effects, if Options B (Green), Option C (Orange), or Option D (Blue) were selected as the Emerging Best Performing Option.

Option B (Green) has been assessed as **Moderate (Dark Green)** in terms of dependence on other infrastructure projects.

Moderate

### 5.4.4 Permits and Wayleaves

At this stage of the assessment, all route options will have a similar issue with permits. However, Option B (Green) has a greater amount of off-road sections and will have greater requirements for wayleaves than Options A and D but less than Option C. As such, Option B has been assessed as **Moderate (Dark Green)**.

Moderate

<sup>46</sup> <http://www.watersupplyproject.ie/>

### 5.4.5 Implementation Timelines

This route option is the second shortest of the four proposed route options however it requires more full closures than Option A (Red) and Option D (Blue) with a few options for traffic diversion. There are higher numbers of key junctions along this route option compared to the other route options. Construction through the settlement of Rathcoffey will also increase timescales due to the complex nature of construction.

Option B (Green) has been assigned a score of **Moderate (Dark Green)** for this criterion.

Moderate

### 5.4.6 Combined Deliverability Performance

Considering the design complexity, traffic disturbance, impact dependence and implementation timelines, a rating of '**Moderate**' (Dark Green) has been assigned. Option B has generally scored well (Moderate) over all but one of the Deliverability sub-topics (traffic disturbance has been assigned a Moderate-High).

Moderate

## 5.5 Economic

As set out in Section 2.3.4, the topic areas under consideration to assist with determining the best route option are as follows:

- Length of installed cable;
- Quantity of Minor and Major service crossings; and
- Number of Major Crossings (such as Horizontal Directional Drills.)

### 5.5.1 Length of Installed Cable

The first economic assessment is from the overall lengths of the cable routes (presented in Table 4.17, Section 4.3.5). From this, Option B (Green) has a total length of 50.4 km which is 8% longer than the shortest route (Option C (Orange)) and therefore it can be assumed to have 8% more of an economic impact in this aspect.

For this reason, route Option B (Green) has been assigned a score of **Moderate (Dark Green)**.

Moderate

### 5.5.2 Quantity of Crossings

An assessment of both the minor and major crossings expected to be encountered for the cable route options has been carried out by categorising them into the different crossing types (presented in Section 2.3.3.2). Summaries of these are listed below where Type 1 has the lowest impact and Type 4 has the highest:

- Type 1 Crossings – shallow crossings (utility/drainage/other) – deeper installation;
- Type 2 Crossings – shallow water crossings (Open cut solution);



- Type 3 Crossings – larger water crossings (Cable bridges/culverts/micro tunnels); and
- Type 4 Crossings – large crossings (Horizontal directional drills/ Auger bores or tunnel solutions).

It has been found that Option B (Green) has the second most Type 1, Joint most Type 2, no Type 3, and joint least Type 4. For this reason, Option B (Green) has been assigned a score of **Low (Cream)**.

Low

## 5.6 Summary of Option B (Green) Assessment

### 5.6.1 Environment Summary

Option B (Green) has been scored as **Low-moderate (Light Green)** overall. There are a range of scores across the environmental topics including a Low score for Planning Policy and Land Use. This Option interacts with less LAP zonings than Option A (Red) as it avoids Kilcock. The environment topics score lower than Option A (Red) and that is reflected in the lower combined performance score. The cultural heritage score is Moderate as there are two more Recorded Monuments (one of which is also a Protected Structure) in proximity to the route option. A summary of the environmental appraisal of Option B (Green) is provided in Table 5.13.

Table 5.13: Summary of Environment Assessment for Option B (Green)

Biodiversity	Soils and Water	Planning Policy and Land Use	Landscape	Archaeology, Architectural Heritage, and Cultural Heritage	Combined Environment Score
Moderate-High	Low-Moderate	Low	Low-Moderate	Moderate	Low-Moderate

### 5.6.2 Socio-Economic Summary

While Option B (Green) travels through the settlement of Rathcoffey, the route option overall is largely considered to have a lower level of social impact than Option A (Red) however in combination, the combined social impact is likely to be similar. As such a risk scoring of 'Moderate' (Dark Green) has been assigned. A summary of the socio-economic appraisal of Option B (Green) is provided in Table 5.14.

Table 5.14: Summary of Socio-economic Assessment for Option B (Green)

Traffic and Transport	Noise and Vibration	Air Quality	Visual	Amenity	Health	Employment and Economy (and Tourism)	Land Use (and Land-take)	Agriculture (including Equine)	Utilities	Combined Socio-economic Score
Moderate – High	Low-Moderate	Low-Moderate	Low-Moderate	Moderate	Low	Low	Low	Low-Moderate	Low-Moderate	Moderate

### 5.6.3 Technical Summary

At this stage in the Proposed Project are there no technical differentiations apart from the number of major crossings. Options A (Red) and B (Green) will have two fewer than Options C (Orange) and D (Blue). Other technical factors will have no impact on the selection of the best performing option. Option B (Green) has been assessed to have a **Low (Cream)** score for the technical criterion.

**Table 5.15: Summary of Technical Assessment for Option B (Green)**

General Compliance	Headroom	Maintainability	Technology Operational Risk	Average Reliability Rates	Repeatability	Combined Technical Score
Low	Low	Low	Low	Low	Low	Low

### 5.6.4 Deliverability Summary

Considering the design complexity, traffic disturbance, impact dependence and implementation timelines, a rating of **'Moderate' (Dark Green)** has been assigned. Option B (Green) has generally scored well (Moderate) over all but one of the Deliverability sub-topics (traffic disturbance has score a 'Moderate-High'). Further design assessment work and consultation with the County Councils will be undertaken at the next stage of the Proposed Project to minimise the disturbance.

**Table 5.16: Summary of Deliverability Assessment of Option B (Green)**

Design complexity	Traffic disturbance	Dependence on other infrastructure projects	Permits and wayleaves	Implementation Timelines	Combined Deliverability Score
Moderate	Moderate-High	Moderate	Moderate	Moderate	Moderate

### 5.6.5 Economic Summary

At this stage in the Proposed Project, the only differentiations between route options are cable route lengths and the impact from the quantity of expected major crossings. Option B (Green) has been assessed to have a **Low-Moderate (Light Green)** score for the economic criterion due to the fewest amount of major crossings (such as HDD) and second shortest in length when compared to the shortest Option C (Orange).

**Table 5.17: Summary of Economic Assessment of Option B (Green)**

Length of Installed Cable	Quantity of Crossings	Combined Economic Score
Moderate	Low	Low-Moderate

## 6. Option C (Orange)

This section outlines the assessment of Option C (Orange) against the five assessment criteria – Environment; Socio-Economic; Technical; Economic; and Deliverability and their sub-topics.

### 6.1 Environment

As set out in Section 2.3.1, the 'Environment' criterion assessment topic under consideration to assist with determining the Emerging Best Performing Option best route option are as follows:

- Biodiversity (Flora and Fauna);
- Soils and Water;
- Planning Policy and Land Use;
- Landscape; and
- Archaeology, Architectural Heritage, and Cultural Heritage.

#### 6.1.1 Biodiversity (Flora and Fauna)

##### 6.1.1.1 European Sites

Option C (Orange) broadly follows the Option B (Green) route south to Maynooth and from Sallins to Dunstown substation. Option C (Orange) is not located within or adjoining any European site. The nearest European site is Rye Water/Cartron SAC located approximately 3km downstream of Option C (Orange) and designated for petrifying springs with tufa formation, narrow-mouthed whorl snail and Desmoulin's whorl snail (Appendix A.1). Option C (Orange) is hydrologically connected to this European site by four river crossings that flow into the SAC. This route option requires the least river crossings (18 crossings) however involves the greatest length of off-road section. This route option involves crossing of watercourses with direct hydrological links to a complex of European sites within Dublin Bay including Rye Water/Cartron SAC (located 3km downstream at the closest point), South Dublin Bay and River Tolka Estuary SPA and South Dublin Bay SAC (see Appendix A.1). In the absence of mitigation, during construction and depending on crossing methodology there is potential for impacts to aquatic habitats and species downstream through a pollution event. Habitats along the south of Option C (Orange) (as with Option A (Red) and Option B (Green)) are suitable to support foraging qualifying interests bird species from Poulaphouca Reservoir SPA and are within the foraging ranges of SCI bird species. Therefore, there is potential for disturbance impacts to these species and temporary loss of habitat during construction if undertaken during wintering bird season.

##### 6.1.1.2 National Sites

No NHA sites are located in proximity to this route option. This route option directly crosses the Royal Canal pNHA west of Maynooth and the Grand Canal pNHA on two occasions at Sallins and Naas however a HDD method adopting a rigorous mitigation plan will be employed at these major crossings and therefore impacts to aquatic receptors will be minimised or avoided.

##### 6.1.1.3 Watercourses and Aquatic Species

This route option involves the crossing of several major rivers including Rye Water, River Liffey and tributaries of the River Tolka with varying WFD status's ranging from 'Good' to 'Poor'. There are potentially six major river crossings requiring HDD and six smaller rivers and streams likely to require alternative crossing methods such as open cut. These rivers host an abundance of aquatic species. Open cut may not be possible across salmonid watercourses. The River Liffey supports Atlantic salmon and brown trout whilst the Rye Water River is known to

support minnow, European eel and lamprey sp. And is also a spawning ground for brown trout and salmon. White-clawed crayfish has been recorded at Leixlip within the Rye Water River. Otter have been recorded in all the major watercourses. Several rivers were noted to be suitable to support kingfisher with one bird recorded hunting along the River Liffey during field surveys.

#### 6.1.1.4 Recent Field Survey Data and Desk Based Review

An initial drive over comprising visual assessments and targeted spot checks at static locations of the accessible sections of the option was undertaken on the 11<sup>th</sup>, 12<sup>th</sup> and 13<sup>th</sup> of October 2021 to scope for wintering bird surveys. The dominant habitats recorded along Option C (Orange) include hedgerows, treelines, agricultural grassland, tillage land (predominantly cereal production), amenity grassland and watercourses. Habitats along Option C (Orange) have the potential to support breeding and wintering bird species including Annex I species and birds included in the amber and red list of Birds of Conservation Concern in Ireland (BoCCI). A number of red listed (snipe and golden plover) and Annex I (kingfisher) bird species were recorded during visit one of the wintering bird surveys in October 2021. Hen-harrier winter roost surveys commenced in October 2021 west of Option C (Orange) however no birds were recorded during the surveys. Devil's bit scabious, the food plant of the Annex II listed marsh fritillary butterfly, was recorded near Dunstown substation within Harristown Common. In the absence of mitigation, this route option could have direct habitat loss impacts on an area of Annex I Oak-ash-hazel woodland habitat (91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles) south of Maynooth which the L5042 road currently bisects.

A search of the National Biodiversity Data Centre records included records for several protected species including common frog, pine marten, common lizard, red squirrel, badger and otter in the vicinity of Option C (Orange). As noted above with Option A (Red) and Option B (Green), a data request submitted to Birdwatch Ireland for Irish Wetland Bird Survey (I-WeBS) data for Poulaphouca Reservoir SPA and any incidental records available for Co. Kildare and Co. Meath was received in October 2021 and showed a number of wintering bird species recorded 8km from Option C at Poulaphouca and across the two counties.

Given the routing of a considerable proportion of the route option along narrow road networks bordered by hedgerows and treelines there will be a requirement for vegetation removal to accommodate the cable installation. The route option is bounded in parts by species rich hedgerows and mature tree lines and the removal of these has the potential to result in habitat fragmentation and impacts on protected species. There is also potential for impacts to wintering and breeding birds through disturbance, habitat loss and pollution during construction. Given the distance of the route option there is a high likelihood that invasive non-native species listed on the Third Schedule of the EC (Birds and Natural Habitats) Regulations will be encountered along the road networks. All lengths of the proposed route option not situated in the road surface has the potential for impacts on biodiversity.

#### 6.1.1.5 Summary of Assessment

As with Option A (Red) and Option B (Green), the greatest impacts on biodiversity for Option C (Orange) would be during construction. There is potential (particularly from passing bays and watercourse crossings) for impacts on hedgerows, tree lines and aquatic ecosystems in particular; other habitats and species may also be disturbed or fragmented during the construction phase and effects could be permanent in some cases. This route option could involve direct habitat loss to an area of Annex II woodland. In the absence of mitigation there is the potential for impacts to Rye Water/Cartron SAC in the event of a pollution incident during construction.

In summary there is a **Moderate-High risk (Light Blue)** risk of a significant impact to biodiversity assets due to Option C (Orange).

**Moderate-High**

## 6.1.2 Soils and Water

### 6.1.2.1 Geology and Soils

Option C (Orange) is underlain predominantly by Carboniferous limestone bedrock, with associated calcareous shales, and older Silurian greywacke, siltstone and shale in the south of the Study Area. There are no mapped karst landforms or Geological Heritage sites recorded in the vicinity of the route option. However, the route option crosses rocks in which karst features have been recorded and the potential exists for unmapped features to occur in proximity to the route option. Karst features are associated with the dissolution of limestone and the formation of ground cavities, which may not always be apparent at the surface, with consequent subsidence risks and enhanced subsurface drainage.

Superficial deposits underlying Option C (Orange) are predominantly glacial tills, derived from the underlying limestone and, in the north, sandstone and shale bedrock. There is also alluvium associated with watercourses and some areas of sand and gravel are crossed by the route in the southern half of the Study Area.

The route option crosses areas of potential geologic economic deposits (sand and gravel, granular aggregate and crushed rock), predominantly in the southern half of the Study Area. However, the areas crossed are small and these deposits are widely available in the surrounding area, so that this is not considered a significant constraint for route selection.

#### 6.1.2.1.1 Summary of Assessment

In terms of geology and soils the overall evaluation for Option C (Orange) is ranked as **Low (Cream)** risk based on currently available information. However, the potential for unmapped karst features should be noted and further assessment may be needed to identify potential for ground stability issues.

Low

### 6.1.2.2 Groundwater

The majority of Option C (Orange) lies within the Dublin (poorly productive bedrock) WFD groundwater body, with a small area in the north within the Dunshaughlin (productive fissured bedrock) groundwater body. In the south of the Study Area the route option crosses the Naas (karstic) and Curragh Gravels East (gravel) groundwater bodies.

The majority of the route option is underlain by bedrock classified as Locally Important Aquifer (bedrock which is generally moderately productive in local zones), with a small area of Regionally Important Aquifer – Karstified (diffuse) crossed in the southern half of the Study Area. Some areas classified as of High groundwater vulnerability are crossed by the route option, predominantly in the southern half of the Study Area, along with some very limited areas of Extreme groundwater vulnerability. However, Option C (Orange) crosses a smaller total area of higher groundwater vulnerability than Options A (Red) and Option D (Blue). While there are no mapped karst landforms in the vicinity of the route, the route option crosses rocks in which karst features have been recorded and the potential exists for unmapped features to occur. Karst features can be associated with significant groundwater flowpaths and may be important in supporting surface water features and sensitive groundwater-fed ecosystems.

There are no Public & Group Supply Source Protection Areas or Group Water Schemes in the vicinity of the route option. There are a large number of groundwater wells and springs mapped by the Geological Survey Ireland across

the Study Area. However, in accordance with TII guidance<sup>47</sup> and the observation that low yielding wells, used mainly for domestic and farm water supply, are very common in Ireland, the assessment has focused on high-yielding springs and wells used for public water supply and their surrounding protection zones and the total number of wells and springs along each route corridor has not been used in assessing relative impacts between route options.

No groundwater dependent water bodies or groundwater dependent terrestrial ecosystems (GWDTEs) have been identified at this stage of assessment and so these features have not been used in assessing relative impacts between route options. However, the potential exists for such features to be present within the Study Area and it cannot be conclusively determined at this stage whether or not they may be a constraint for the proposed route.

There is potential for dewatering operations associated with crossings of large watercourses, major roads and railways. This applies to all options and no specific issues have been identified for Option C at this stage.

#### 6.1.2.2.1 Summary of Assessment

The overall evaluation for Option C (Orange) is ranked as **Low (Cream)** risk based on currently available information. However, the potential for unmapped karst features should be noted and further assessment may be needed to identify potential for interference with groundwater flows and potential for groundwater flooding issues.

Low

#### 6.1.2.3 Surface Water

There are 11 surface waterbodies crossed by route Option C; some more than once. A full list of water bodies and their current status is provided in Table 6.1 as well as their proximity to the Rye Water Valley/Carton SAC, their sensitivity to change, the likely crossing technique to be employed and the potential for impacts as a result.

**Table 6.1: Surface Water Bodies Option C**

Waterbody	Status	Number of Crossings	Connection & Proximity to Rye Water Valley/Carton SAC (at closest crossing)	Sensitivity	Impact Potential
Liffey_100	Moderate	2	No connection	Medium	Low
Grand Canal Naas Line	Good	1	No connection	Very High	Low
Grand Canal Main Line	Good	1	No connection	Very High	Low
Liffey_120	Good	2	No connection	Very High	Low
Liffey_130	Good	4	No connection	Very High	Medium
Royal Canal Main Line	Good	1	No connection	Very High	Low
Lyreen_020	Poor	2	No connection	Low	Medium
Rye Water_020	Moderate	1	3.3km	High	High
Rye Water_030	Moderate	2	4.5km	High	Medium
Dunboyne Stream_010	Moderate	1	No connection	Medium	Low
Tolka_020	Poor	1	No connection	Low	Low
		18			

<sup>47</sup> TII. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes. Unreferenced. Obtained from: [www.tii.ie/technical-services/environment/planning/](http://www.tii.ie/technical-services/environment/planning/) (accessed October 2021). TII guidelines have been used as they are relevant to all linear infrastructure projects.

In addition to water bodies being directly crossed by the route option, for Option C (Orange) there are also a number in close proximity which may be at risk from silty water runoff or spillages of hydrocarbons during construction. These water bodies are less than 50m from the cable route:

- Liffey\_120: the route option runs alongside this water body, at approximately 10m from the bank edge, for 375m. The Liffey\_120 is of very high sensitivity and there is a high impact potential from having a trench in such close proximity for this length;
- Liffey\_120: Further north, at Bodenstown Golf Club, the route option passes in close proximity (less than 10m) to this water body again, this time a tributary to the main channel. However this is only for a very short stretch as the water body is perpendicular to the route option at this point. The route option is in the road in this section, however it is likely that surface water drains would discharge to the water body, or else the road drains 'over the edge' to it. The impact on this water body at this location would be low to medium;
- Rye Water\_020: the route option runs alongside this water body, at approximately 25m from the bank edge, for 140m. The Rye Water\_020 is of high sensitivity and there is a medium to high impact potential from having a trench in such close proximity for this length; and
- Rye Water\_030: the route option runs alongside this water body, at less than 10m from the bank edge, for 260m. The Rye Water\_030 is of high sensitivity. The cable is being laid within a road in this location, however it is likely that surface water drains will discharge to the water body or that the road is designed for 'over the edge' runoff from the road to the water body. Therefore there is a high impact potential from having a trench in such close proximity for this length.

#### 6.1.2.4 Flood Risk

For Option C (Orange), the length (in metres) within a PFRA flood risk area is:

- Pluvial: 987m; and
- Fluvial: 1606m.

There are 18 No. watercourse crossings along the route; all crossings will be designed so do not present an increase in flood risk, either pluvial or fluvial.

##### 6.1.2.4.1 Summary of Assessment

Considering the number of crossings of water bodies (approximately 18 no.), in particular the crossings of those with high or very high sensitivities, as well as the potential for open cut crossings in addition to potential flood risk, Option C (Orange) is ranked as **Low-Moderate risk (Green)** in respect to the Soils and Water assessment topic.

**Low-Moderate**

### 6.1.3 Planning Policy and Land Use

#### 6.1.3.1 Planning Policy and Legislation

Option C (Orange) follows the same route as Option B (Green) until Crinstown, south west of Maynooth. As with Option B (Green), it bypasses zoned lands in both Kilcock and the west of Maynooth. After Crinstown, it follows a more direct southerly route, passing to the east of Clane and to the west of Straffan, avoiding zoned lands within the LAPs for both towns. It then rejoins the same route as all other route options north west of Sallins, avoiding zoned lands designated in the Sallins LAP. From there it follows the same route as Option B (Green), avoiding Naas



town centre and runs parallel with the M7 through Naas South, cutting through Jigginstown and Bluebell before joining the R448 and turning south towards Dunstown station.

### 6.1.3.1.1 Draft Naas Local Area Plan 2021-2027

Option B (Green) passes along the western boundary of Naas, interacting with a number of zoned lands at Millennium Park, Naas South, Jigginstown and Naas East. These zonings are described in the Table Below.

**Table 6.2: Relevant Zoning Objectives Naas LAP**

Zoning Objective (Naas Local Area Plan 2021-2027)	
B Existing/Infill Residential	To protect and enhance the amenity of established residential communities and promote sustainable intensification.
E Community & Education	To provide for education, recreation, community and health
F Strategic Open Space	To preserve, provide for and improve recreational amenity, open space and green infrastructure networks.
H Industry and Warehousing	To provide for industry, manufacturing, distribution and warehousing.
H(5) Industry and Warehousing	To provide for industry, manufacturing, distribution and warehousing.
P2 Data Centre/Warehouse	To provide for Data Centre development and their associated infrastructure only.
Q3 Office, Enterprise and Employment	To provide for and facilitate the provision of high job-generating uses.
Q4 Office . Enterprise and Employment	To provide for and facilitate the provision of high job-generating uses.
R Retail/Commercial	To support continued operation of existing commercial uses.

### 6.1.3.2 Planning Applications

A review of all granted and live applications over the last five years has been performed within a 50m buffer, 25m either side of Option C (Orange). Some of these applications will be new receptors which will have already been constructed by the time construction on the Proposed Project commences. These include both individual dwellings and larger development as shown in the LAPs. Of these, some of the notable applications are highlighted in the table below.

**Table 6.3: Notable Applications in proximity to Option C (Orange)**

Local Authority	App. Number	Brief Description	Address	Status
Kildare County Council	16434	New right hand turning lane, bus set down area and associated works, a lift to existing 110kv overhead power lines, removal of derelict prefabricated structures and culvert of ditch within the site and the construction of a 10,450sqm two and three storey 1000 pupil post-primary school and associated infrastructure including, ESB substation, 92 car park spaces, 250 cycle parking spaces, bus and car set down and pick up facilities, and play areas	Plots No. 71 and 72 and part Plots 85 and 86 of the Millennium Park Master Plan , Millennium Park , Naas	Granted 09/06/2017
Kildare County Council	171143	a cemetery comprising a total of 1,448 plots, 30 car parking spaces, overflow parking area (with gates), new vehicular entrance and associated site works and infrastructure	Bodenstown , Sallins , Co. Kildare.	Granted 15/08/2018

Local Authority	App. Number	Brief Description	Address	Status
Kildare County Council	1971	a 4,326 sqm. Two storey office building, 166 no. surface car parking spaces, 36 no. cycle parking spaces, signage, a standalone single storey substation and associated site works and infrastructure	lands to west of the existing Aldi Regional Office and Distribution Centre , Southern Link Business Park Newbridge Road	Granted 15/07/2019
Kildare County Council	191269	change of use of existing warehouse building to light industry/workshop use together with new single storey extension. Entrance alterations, on-site parking and associated site works and infrastructure.	Mylerstown , Two Mile House , Naas	Granted 02/06/2020
Kildare County Council	20840	the construction of a 5627sqm Specialist Packaging Single Storey High Level Manufacturing Facility with Three Storey Head office and associated infrastructure	Millennium Business Park , Osberstown , Naas	Granted 30/03/2021 (subject to financial appeal)
Kildare County Council	201564	(a) Extension of the existing 7.3m wide two-lane carriageway by 137m to the north (b) a 2m grass verge, 2m cycle path and 2m footpath along the east and west of the proposed access road extension (c) a vehicular entrance to the west of the proposed extension to facilitate a proposed access to a planned commercial development (Kildare Co. Co. Planning Ref. 20840) (d) a vehicular entrance to the east of the proposed extension to facilitate a proposed access to a planned commercial development (Kildare Co. Co. Planning Ref. 20561)   parking provision and associated infrastructure	Millennium Park , Osberstown , Naas	Granted 01/07/2021
Kildare County Council	21114	Application to amend the design of Kildare County Council Planning Reg Ref 17/535 for the development of a solar photovoltaic panel array of up to 74,172 m <sup>2</sup> of solar panels and associated infrastructure on ground mounted steel frames within a site area of 25.04 hectares. Amendments involve an increase in the solar panel area from the permitted up to 74,180 m <sup>2</sup> of solar panels to up to 150,000 m <sup>2</sup> of solar panels and an increase in height of panels.	Smithstown and Roosk , Co. Kildare.	Granted 05/08/2021

These applications, as well as the more minor/domestic applications, will be taken into account in the routing of the cable. Other larger scale planning applications will also be examined and taken into account within the routing process. Such applications include other energy projects, the Water Supply Project, and road schemes.

### 6.1.3.3 Summary of Assessment

Taking the above into account, Option C (Orange) has the potential to interact with a number of granted and live planning applications. However, it has been routed in such a way that it avoids many potential interactions with LAP zonings, only traversing lands zoned within the Draft Naas LAP. Furthermore, it is also acknowledged that with appropriate siting and mitigation, the impacts of these interactions can be further minimised. Therefore, Option C (Orange) has been assigned **Low-Moderate (Light Green)** in terms of the combined impacts to land use and planning policy.

**Low-Moderate**

## 6.1.4 Landscape

### 6.1.4.1 Landscape character

Refer to Section 4.1.4.1 for information on landscape character.

### 6.1.4.2 Landscape elements

No designated or highly sensitive landscape elements were identified within the portion of the Study Area that occurs within County Meath.

Included in Table 14.4 of Chapter 14 (and indicated on Map 14.2) of the Kildare County Development Plan are:

*'12 "principal landscape sensitivity factors": Major Rivers and Water bodies; Canals; Ridgelines; Green Urban Areas; Broad-Leaved Forestry; Mixed Forestry; Natural Grasslands; Moors and Heathlands; Agricultural Land with Natural Vegetation; Peat Bogs; Scenic View; and Scenic route'.*

This route option will pass within 300m of the following 'principal landscape sensitivity factors' (from north to south):

- River Liffey; and
- Woodland R412 regional road.

#### 6.1.4.2.1 Sensitivity - landscape elements

The sensitivity of these '*principal landscape sensitivity factors*' are recorded in Table 6.4.

#### 6.1.4.2.2 Magnitude of impacts - landscape elements

The magnitude of impacts on landscape elements are as follows:

- **River Liffey:** Approximately 3.7km of the route option passes within an area of '*special sensitivity*' that buffers the River Liffey '*principal landscape sensitivity factor*'. This area would have a heightened sensitivity to the removal of vegetation. Within this '*principal landscape sensitivity factor*' approximately 14.2km of the route option occurs within agricultural fields; thus, the construction activity here would be uncharacteristic. For these reasons, the magnitude of impact during the construction phase is deemed to be low. The agricultural land use will be reinstated and the river crossing is likely to be by directional drilling; therefore the likely magnitude of impact during the operational phase is likely to be negligible; and
- **Woodland R412 regional road:** It is likely that the R412 regional road is wide enough to accommodate the trenching work without the need to remove roadside vegetation; therefore, there will be no material change. Thus the magnitude of impact is deemed to be negligible during both the construction and operational phases.

#### 6.1.4.2.3 Significance of impacts - landscape elements

All the impacts on the '*principal landscape sensitivity factors*' identified are of a negligible magnitude during the operational phase; therefore, are considered, by default, to have a significance of impact that is **Imperceptible**. During the construction phase only the River Liffey '*principal landscape sensitivity factor*' is likely to have a significance of **Slight-Imperceptible**, while for all the others, it will be **Imperceptible**.

**Table 6.4: Summary - Principal Landscape Sensitivity Factors within County Kildare**

Principal Landscape Sensitivity Factor	Specific feature	Sensitivity of feature	Likely operational magnitude of effect	Likely operational significance of effect
Major Rivers and Water bodies	River Liffey	High-medium	Negligible	Imperceptible
Mixed Forestry	Woodland R412 regional road	High	Negligible	Imperceptible

### 6.1.4.3 Summary of Assessment

A 14.2km offline section passes through agricultural fields near the River Liffey '*Principal Landscape Sensitivity Factor*'; therefore, there is a potential for some impact on the landscape character within this area of 'special' sensitivity, but significant impacts are not anticipated. No significant landscape or visual impacts are anticipated. Whilst the magnitude of impact during both construction and operation is at the very bottom end of the magnitude spectrum; some receptors are deemed to have a sensitivity that is at the upper end of the sensitivity spectrum thus a relatively small increase in the magnitude of effect during the construction phase could result in a significant impact, therefore the attributed score is **Low-Moderate (Green)**.

**Low - Moderate**

### 6.1.5 Archaeology, Architectural Heritage, and Cultural Heritage

Option C (Orange) includes sections common to Option A (Red) and Option B (Green), and therefore the receiving environment is similar to that described in Sections 4.1.5 and 5.1.5 above.

A summary of archaeology, architectural heritage, and cultural heritage constraints identified within the Step 3 Study Area is presented in the Environmental Constraints Report along with a discussion on the general character and nature of the constraints present, comprising National Monuments and Preservation Orders, sites on the RHM, Recorded Monuments and sites recorded on the SMR, Protected Structures, structures recorded on the NIAH, ACAs, and GDLs identified by the Survey of Historic Gardens and Designed Landscapes.

Baseline information on the archaeology, architectural heritage and cultural heritage constraints identified within 100m of Option C (Orange) is provided in Appendix B.1

#### 6.1.5.1 Archaeology

There are no National Monuments, sites with Preservation Orders placed on them, or sites on the RHM located within 100m of Option C (Orange).

Three Recorded Monuments are located within 100m of Option C (Orange) (see Appendix B.1). These comprise the site of a medieval parish church (AY\_04) and two enclosures identified from aerial photographs (AY\_14 and AY\_17).

A total of 15 sites recorded on the SMR have been identified within 100m of Option C (Orange). These comprise evidence of medieval and post-medieval religious activity (AY\_05, AY\_06, AY\_29, AY\_30, and AY\_31) and the locations of cropmarks (AY\_10, AY\_25, AY\_32 – 34, AY\_35, AY\_36, and AY\_46 – 48).

Further information on the archaeological constraints identified within 100m of Option C (Orange) is included in Appendix B.1.

#### **6.1.5.1.1 Archaeological Potential**

Alluvium and lacustrine deposits have the potential to preserve previously unknown archaeological monuments and remains, including organic and palaeoenvironmental remains, and there is also the potential for votive (religious) offerings in rivers such as the Rye Water, River Lyreen and the River Liffey, minor watercourses and bogs.

#### **6.1.5.2 Architectural Heritage**

Architectural heritage constraints within 100m of Option C (Orange) comprise:

- Four Protected Structures characterised by post-medieval churches (AH\_02 and AH\_13) and estate buildings (AH\_10 and AH\_14).
- Eight GDLs comprising five recorded by the Survey of Historic Gardens and Designed Landscapes and three identified from historic mapping (Ordnance Survey 6", 1837 – 1842).

No structures included on the NIAH, or ACAs, are located within 100m of Option C (Orange).

Further information on the architectural constraints identified within 100m of Option C (Orange) is included in Appendix B.1.

#### **6.1.5.3 Cultural Heritage**

A total of 27 cultural heritage sites identified within 100m of Option C (Orange) from the sources identified in Section 2.3.1.5. These are characterised by extant post-medieval buildings and structures, including road bridges, houses and farm buildings. Further information on these cultural heritage sites is presented in Appendix B.1.

#### **6.1.5.4 Potential Impacts**

##### **6.1.5.4.1 Construction – Direct Impacts**

##### **Archaeology**

No direct impacts have been identified on National Monuments, sites with Preservation Orders, or sites on the RHM as a result of the construction of Option C (Orange).

Where Option C (Orange) is located within the Zone of Notification associated with a Recorded Monument, this has been identified as a direct impact. While the route option may not directly impact the Recorded Monument itself, excavation of the cable trench and joint bays could have a direct impact on any archaeological remains that may survive within this zone.

Option C (Orange) is located within the Zone of Notification of one Recorded Monument (AY\_04). Within this zone it is located in the carriageway of the existing road the construction of which is more than likely to have removed or truncated any archaeological remains associated with this monument that may have been present. However, construction, including the excavation of the cable trench and joint bays would have a direct impact on any archaeological remains that may survive. Construction would also have a direct impact on any archaeological remains associated with this Recorded Monument that may survive within any additional land take required for construction.

While construction would be within the existing carriageways may have partially removed or truncated any remains associated with, the option has the potential to remove archaeological remains associated with AY\_05, AY\_31, AY\_35, and AY\_46 – 48, construction of Option C (Orange) would have a direct impact on any archaeological remains associated with these constraints that may survive. In addition construction would have a direct impact

on any unknown archaeological remains associated with these constraints that may survive within any additional land take required for construction.

The excavation of the cable trench and joint bays would have a direct impact through the removal of any archaeological remains associated with AY\_10 (an enclosure) which is located in an offline section in Laraghbryan East.

Excavation of the cable trench and joint bays, and the excavation of temporary launch and reception pits for directional drilling may also result in a direct impact any previously unknown archaeological remains that may be present within the land required for Option C (Orange). The potential for this impact is considered to be higher in previously undeveloped areas than within the existing carriageways, the construction of which is likely to have likely to have removed or truncated any archaeological remains that may have been present.

### **Architectural Heritage**

Should Option C (Orange) require additional land take for construction, the removal of boundary features would have a direct impact on five GDLs (Jenkinstown House; DL\_02, Rodanstown House; DL\_05, Irishtown; DL\_12, Blackhall; DL\_16 and Killashee House; DL\_20).

### **Cultural Heritage**

One post-medieval road bridge (CH\_01) is located on the existing road through Culcommon. There is potential for a direct impact on this cultural heritage constraint as a result of accidental damage from construction plant.

The excavation of the cable trench and joint bays may have a direct impact through the removal of any surviving remains associated with five cultural heritage sites (CH\_08, CH\_18, CH\_25, CH\_44 and CH\_52).

CH\_03 is a public house located immediately adjacent Option C (Orange). There is therefore potential for a direct impact on this cultural heritage constraint as a result of accidental damage from construction plant.

#### **6.1.5.4.2 Construction - Indirect Impacts**

##### **Archaeology**

No indirect impacts have been identified on archaeological constraints as a result of the construction of Option C (Orange).

##### **Architectural Heritage**

This route option is located within 28m of Rodanstown Church (AH\_02), Irishtown House (AH\_10), Bodenstown Church (AH\_13), and the gate lodge and entrance of Castlesize House (AH\_14). While these potential impacts would result from the introduction of noise and visual intrusion into the setting of these constraints during construction from the movement and operation of plant, it is anticipated any intrusion would be temporary (lasting the duration of construction in each location).

##### **Cultural Heritage**

Movement and operation of plant during the construction of Option C (Orange) would have an indirect impact on the setting of 11 cultural heritage sites (CH\_03, CH\_09, CH\_23, CH\_27, CH\_32, CH\_49, CH\_54, CH\_55, CH\_57, CH\_58, and CH\_59). However, it is anticipated any intrusion would be temporary (lasting the duration of construction in each location).

### 6.1.5.4.3 Operational Impacts

As the Proposed Project would be located beneath the road surface, and any offline sections would be reinstated after construction no impacts on archaeological, architectural or cultural heritage constraints have been assessed as a result of the operation of Option C (Orange).

### 6.1.5.5 Summary of Assessment

Fewer impacts overall have been identified on designated archaeology, architectural heritage and cultural heritage constraints as a result of the construction of Option C (Orange) in comparison with the other options.

While potential direct impacts on sites identified on the SMR would be comparable to other route options, this route option also requires more off-road sections (totalling approximately 15.5km) and may potentially result in direct impacts resulting from the removal of previously unknown archaeological monuments and remains within these areas. Therefore, Option C (Orange) has been assigned a risk of '**Low-Moderate (Light Green)**'.

**Low-Moderate**

A Route Corridor Summary Matrix for archaeology, architectural heritage and cultural heritage is provided in Appendix B.1.

As the project progresses it may be possible to avoid impacts on archaeology, architectural heritage, and cultural heritage constraints through design, including localised realignments of the route. Where impacts on archaeology, architectural heritage, and cultural heritage constraints cannot be avoided it is possible impacts could be reduced through recording in advance of, or during, construction, including the archiving and documentation of the results of this recording for public reference.

## 6.2 Socio-Economic

### 6.2.1 Traffic, Transport and Access

Option C (Orange) runs mainly through the centre of the Study Area between the Woodland and Dunstown substations. The route is the shortest one compared to the other potential route options and it mainly follows the alignment of Option B (Green), except for the sections of the route in the middle of the Study Area between Maynooth and Sallins.

Table 6.5 presents the break-down of road classifications for the Option C route:

**Table 6.5: Option C (Orange) Road Classification**

Option	Total Length (km)	Road Length Percentage Distribution		
		Regional	Local Roads and Smaller	Off-road and other Land Types
Option C	46.7	17.1	42.8	40.1

Option C (Orange) affects the lowest number of regional roads and is located mostly along local or lower roads, with offline sections to the west of Maynooth and to the east of Clane, crossing the most agricultural land compared to the other route options.



The access to the local roads during construction could be challenging for the construction vehicles. The narrow local roads along Option C (Orange) could pose a significant constraint to the use of the public highway to deliver construction materials. In attempting to use these roads, potential impacts include driver and pedestrian delay; increased fear of accidents; and severance effects for local communities and businesses.

It is anticipated that during the installation of cable works, construction would extend through a number of key junctions and roundabouts along Option C (Orange), which could have a significant impact in traffic disturbance. There might be a requirement to divert traffic, particularly at congested junctions and areas which may give rise to more complex traffic management plans during the construction phase. These areas are identified in section 6.4.2. Similar to the route sections there might be a requirement to temporarily divert traffic or restrict certain vehicle movements at these locations. Traffic management measures would be assessed on a case-by-case basis for each signalised junction and standard roundabout along Option C (Orange). The number of the key junctions along Option C (orange) is the third highest compared to the other proposed route options.

Option C (Orange) has the lowest number of properties impacted compared to the other route options within 0 to 50 meters from its centreline – approximately 209 properties. It is noted that the proposed alignment would potentially impact the least amount of community assets compared to the other route options. It is anticipated that Option C (Orange) could also impact the access to the St. Joseph's National School in Mulhussey.

### 6.2.1.1 Summary of Assessment

Option C (Orange) is the shortest of the options and affects the lowest number of regional roads. It has the greatest amount of agricultural land impacted and has the lowest number of properties within 0 to 50 metres. The smaller number of regional roads affected would reduce the overall amount of traffic affected. The lower number of regional roads affected would reduce the overall amount of traffic affected, although the narrower width of the local roads might require as a result a greater number of full road closures compared to other options. Full road closures will result in more disruption through diversions. Mitigation measures through consultation and traffic management will reduce the impacts. The measures can include ensuring that the works do not disrupt access to the schools and other receptors. Phasing of the works will be important to minimise disruption. This can be done by ensuring that works are completed at less busy times and are carefully planned to avoid road users being disrupted in multiple locations by construction teams in one journey. These measures will be designed at the next step in the Proposed Project. In terms of risk of traffic disruption, the Traffic, Transport and Access (Social) for Option C (Orange) is assessed to be of **Moderate – High (Light Blue)**.

**Moderate - High**

## 6.2.2 Noise, Vibration and Air Quality

### 6.2.2.1 Noise and Vibration

#### 6.2.2.1.1 Baseline

Option C (Orange) runs mainly through the centre of the Study Area between the Woodland and Dunstown substations. The route mainly follows the green route except for the sections in the middle of the Study Area between Maynooth and Sallins. The route is located along regional and local roads with offline sections to the west of Maynooth and to the east of Clane. Offline or off-road sections are sections where the route option does not follow alongside a road but cuts across, for example, agricultural land.

Baseline noise levels are likely to vary along this route option with higher noise levels likely closer to transport infrastructure and during periods of peak transport activity. The main noise source along this route option is from road traffic noise. Environmental Protection Agency (EPA) traffic noise data for Round 3 contained in EPA Maps<sup>48</sup> shows that traffic noise levels will be highest where the route option crosses the M4 and the M7 and where it runs alongside the R448.

EPA railway noise data shows that where the route option crosses the Dublin to Cork railway line rail noise levels are elevated.

### 6.2.2.1.2 Methodology

The noise and vibration assessment at this stage of the Proposed Project involves gaining an appreciation of the baseline noise environment close to each of the proposed route options and identifying noise and vibration sensitive receptors within distance bands up to 300m from each of the proposed route options. Noise impacts from construction activities do not normally occur beyond 300m and vibration impacts do not normally occur beyond 100m. The locations of major crossings where HDD is likely to be required and off-road sections where noise impacts are likely to be greater compared to on-road sections is also used to assess each route in terms of the noise risk according to the multi criteria analysis at Step 4A. The risk scale is as follows:

- High: dark blue;
- Moderate-high: blue;
- Moderate: dark green;
- Low-moderate: green; and
- Low: cream.

No baseline noise surveys were undertaken, and no noise modelling was undertaken at this stage of the Proposed Project. These will be completed at Step 5 of the Proposed Project.

### 6.2.2.1.3 Noise and Vibration Sensitive receptors

Table 6.6 shows the residential property counts in distance bands up to 300m from the proposed route option. Overall there are a total of 552 sensitive receptors within 300m of the proposed route option.

**Table 6.6: Residential Property Counts within 300m of Option C (Orange)**

Option	No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	No. of sensitive receptors 100-200m	No. of sensitive receptors 200-300m	Total no. of receptors within 300m
Option C	209	103	136	114	562

As well as residential properties there are other sensitive receptors within 300m of the proposed route option which are not included in the above counts including:

- St. Joseph's National School;
- Gaelscoil Nás Na Ríogh School;
- St David's National School;
- Piper's Hill College;
- Killashee National School;

<sup>48</sup> <https://gis.epa.ie/EPAMaps/>

- The K Club; and
- Several equine operations.

#### 6.2.2.1.4 Potential Noise and Vibration Impacts

##### Areas of Potential Horizontal Directional Drilling (HDD)

There is greater potential for adverse noise and/or vibration impacts at sensitive receptors where construction activities would occur over a longer period, e.g. at trenchless crossings. It is recognised that certain construction activities at certain trenchless crossings could be required to take place outside of normal working hours, which would increase the likelihood of adverse noise effects occurring. In addition, certain potential trenchless crossing techniques that may be employed (e.g. HDD) also have the potential to cause adverse vibration effects at nearby receptors.

There is potential for adverse impacts at receptors within 300m of HDD works and there could be eight major crossings on Option C (Orange). An initial assessment has shown there are the potential for adverse noise impacts at the Royal Canal Main Line, the Dublin-Sligo Railway line, the M4 Motorway, the Dublin-Cork railway line, and the M7 Motorway.

##### Offline Sections

For the majority of the proposed route option, the underground cables are expected to be installed using 'Open Cut' techniques. Where 'Open Cut' works are undertaken adjacent to the existing road network, there is a relatively low potential for temporary impacts due to construction noise. This is due to the relatively high levels of local environmental noise that are typically experienced adjacent to roads. Also, as the works are expected to progress in sections, noise levels at any receptor would only be elevated for a relatively short period of time. However, where 'Open cut' works are undertaken in relatively quiet areas close to sensitive receptors there is the potential for temporary impacts due to construction noise.

Table 6.7 shows the total length, the total offline length and whether there are receptors within 300m of the offline route for Option C (Orange).

**Table 6.7: Total length and offline length for Option C**

Option	Total Length (km)	Offline Length (km)	Receptors within 300m of offline section
Option C	46.7	15.5	Yes

The table above shows that the route option goes offline for approximately 15.5km of its total length where there is a greater potential to result in adverse noise effects at receptors compared to where works are undertaken adjacent to existing roads.

#### 6.2.2.1.5 Assessment

There are relatively small numbers of receptors within 300m of Option C, and while there is 15.5km of offline construction activity this is largely through open land with few near-by receptors. There are receptors within 300m of potential major crossings such as HDD works at eight crossing points with the potential for experiencing adverse noise and/or vibration effects. As such, it is appropriate to give a score of **Low-Moderate (Light Green)**.

**Low-Moderate**

## 6.2.2.2 Air Quality

### 6.2.2.2.1 Baseline

Option C (Orange) runs mainly through the centre of the Study Area between the Woodland and Dunstown substations. The route option mainly follows the route of Option B (Green) except for the sections of the route in the middle of the Study Area between Maynooth and Sallins. The route option is located adjacent to regional and local roads with offline sections (i.e. not adjacent to roads) to the west of Maynooth and to the east of Clane.

Baseline air pollutant concentrations are likely to vary along this route option. Higher concentrations are likely closer to transport infrastructure and where the route is closer to larger settlements. The main air quality sources along this route are from road traffic, particularly where the route option crosses the M4 and the M7 motorways.

The Air Quality Index for Health across the Study Area<sup>49</sup> is Good (with an index score ranging from 1-3). The majority of the Study Area, as defined by the EPA<sup>50</sup>, is located within Air Quality Zone D – Rural Ireland apart from locations in Naas, which are within Air Quality Zone C – other cities and large towns.

### 6.2.2.2.2 Sensitive receptors

Human and ecological receptors are consistent with those listed in Section 4.2.2.3.

The Institute of Air Quality Management (IAQM) dust guidance<sup>51</sup>, has been adapted for the purposes of this assessment. The number of residential properties and schools have been counted and identified as receptors. Table 6.8 shows the human receptor count within 300m of each of Option C (Orange).

**Table 6.8: Residential Property Counts within 300m of Option C (Orange)**

Option	No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	No. of sensitive receptors 100-200m	No. of sensitive receptors 200-300m	Total no. of receptors within 300m
C	209	103	136	114	562

As well as residential properties there are other sensitive receptors within 300m of the proposed route which are not included in the above counts including:

- St. Joseph’s National School;
- Gaelscoil Nás Na Ríogh School;
- St David’s National School;
- Piper’s Hill College; and
- Killashee National School;

With regard to ecological receptors, Option C (Orange) crosses the Royal Canal pNHA and crosses the Grand Canal pNHA twice. Therefore, these are in close proximity (i.e. less than 20m) from the route option.

<sup>49</sup> Environmental Protection Agency (EPA), Air Quality Index for Health, <https://airquality.ie/information/air-quality-index-for-health>, accessed October 2021.

<sup>50</sup> Environmental Protection Agency (EPA), Air Quality Zones, <https://airquality.ie/information/air-quality-zones>, accessed October 2021.

<sup>51</sup> Institute of Air Quality Management. 2016. Guidance on the assessment of dust from demolition and construction. Version 1.1. <http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf>

### 6.2.2.2.3 Assessment Criteria

The main criteria used for the assessment of each option is set out in Section 4.2.2.3.3.

### 6.2.2.2.4 Potential Impacts

The potential impacts are consistent with those set out in Section 4.2.2.3.4.

Table 6.9 shows the number of receptors, the sensitivity to dust soiling and the risk score.

**Table 6.9: Potential air quality impact for Option C (Orange)**

No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	Sensitivity of section to dust soiling	Risk score
209	103	Medium	1.7

For Option C (Orange) most of its length is classed as low or medium sensitivity areas, apart from around Mulhussey, which has a slightly higher receptor count due to the Proximity of St Joseph’s National School, and is classed as high sensitivity area. Therefore, it is appropriate to give a score of low-moderate (green).

### 6.2.2.3 Summary of Assessment

Option C (Orange) is the shortest option and has the fewest number of receptors within 300m and within 50m of the route. Option C (Orange) runs adjacent to three schools, with a total of five within 300m. Option C (Orange) crosses over two pNHA (Royal Canal pNHA and Grand Canal pNHA (twice)). Therefore, an overall risk score of **Low (cream)** has been applied.

Low

## 6.2.3 Visual

There is the potential for visual impacts at scenic designations, residential dwellings and along public roads, with scenic designations carrying a greater potential for risk.

### 6.2.3.1 Scenic designations

No scenic designations were identified within the portion of the Study Area that occurs within County Meath.

Included in Table 14.4 of Chapter 14 (and indicated on Map 14.2) of the Kildare County Development Plan are’:

*‘12 “principal landscape sensitivity factors”: Major Rivers and Water bodies; Canals; Ridgelines; Green Urban Areas; Broad-Leaved Forestry; Mixed Forestry; Natural Grasslands; Moors and Heathlands; Agricultural Land with Natural Vegetation; Peat Bogs; Scenic View; and Scenic route’.*

This route option will pass within 300m of the following ‘principal landscape sensitivity factors’ that relate to scenic designations (from north to south):

- Royal Canal View RC8 (‘Jackson’s Bridge’ L5041); and
- Grand Canal view GC33 (‘Limerick Bridge’).

### 6.2.3.1.1 Sensitivity - scenic designations

The sensitivity of these '*principal landscape sensitivity factors*' are recorded in Table 6.4.

### 6.2.3.1.2 Magnitude of impacts - scenic designations

**Royal Canal View RC8 ('Jackson's Bridge' L5041):** There is a direct line of sight from the bridge towards the canal crossing point of this route c.300m away, but there is an existing high voltage overhead line crossing the canal at c.150m so the view is already characterised by infrastructure. Construction activity is likely to be visible from this bridge; therefore, the magnitude of impact during the construction phase is deemed to be low, but during the operational phase, it is deemed to be low-negligible as a crossing such as a cable bridge (to be determined at next step of the project) may be visible.

**Grand Canal view GC33 ('Limerick Bridge'):** This bridge is heavily visually enclosed by vegetative screening; therefore, the magnitude of impact is deemed to be negligible during the construction and operational phases.

### 6.2.3.1.3 Significance of impacts - scenic designations

The impact on the Royal Canal View RC8 ('Jackson's Bridge' L5041) '*principal landscape sensitivity factors*' identified are of a low magnitude during the operational phase; therefore, is considered, by default, to have a significance of impact that is **Slight**. The impacts on the Grand Canal view GC33 ('Limerick Bridge') '*principal landscape sensitivity factors*' identified are of a negligible magnitude during the operational phase; therefore, is considered, by default, to have a significance of impact that is **Imperceptible**. During the construction phase only the Royal Canal View RC8 ('Jackson's Bridge' L5041) '*principal landscape sensitivity factor*' is likely to have a significance of **Moderate-slight**, while for all the others, it will be **Imperceptible**.

**Table 6.10: Summary - Principal Landscape Sensitivity Factors within County Kildare**

Principal Landscape Sensitivity Factor	Risk - Direct Impacts (Constraints Study)	Risk – Impacts Within 300m (Constraints Study)	Specific feature	Sensitivity of feature	Likely operational magnitude of effect	Likely operational significance of effect
Scenic View	High	Moderate-High	Royal Canal View RC8 ('Jackson's Bridge' L5041)	High	Low-Negligible	Slight
Scenic View	High	Moderate-High	Grand Canal view GC33 ('Limerick Bridge')	High	Negligible	Imperceptible

### 6.2.3.2 Summary of Assessment

The assessment of the potential or significant visual impacts as a result of Option C (Orange) can be summarised by the following points:

- Potential for visual impacts at residential dwellings and along public roads;
- Potential visual impacts at Royal Canal View RC8 ('Jackson's Bridge' L5041) during construction and operational phases, but the magnitude of the impact is not likely to be greater than Low, therefore no significant visual impacts are anticipated.

As such, the attributed score is **Low-Moderate (Light Green)**.

Low - Moderate

## 6.2.4 Amenity

This section outlines the likely impact on the amenity of residential, commercial, community (and recreational), and tourism receptors, collectively, by way of consideration of contributing environmental effects. Issues of access and severance are outlined in Section 6.2.1. All residential, commercial, community (and recreational) receptors are shown in Figure C.1.3 in Appendix C.1.

The alignment of Option C (Orange) passes through both rural and urban areas along its length, as outlined in Section 3.2.3. Table 6.11 lists the known commercial and community receptors that are situated immediately adjacent to the route alignment (this list is not exhaustive but represents a high-level analysis for the purposes of informing the Step 4A selection process). No tourism receptors (i.e. receptors whose main function is aimed at visitors to its locality) were encountered along the alignment of Option C (Orange), while one-off or ribboned residential receptors are located along all sections of the route (with the exception of off-line sections). Option C (Orange) is also routed along the western side of Naas.

**Table 6.11: Known Commercial and Community Receptors Adjacent to the Alignment of Option C (Orange)**

Commercial receptors:	Community receptors:
Barstown Business Park;	St Joseph's National School;
Hatchet Inn (and associated filling station);	Royal Canal;
Robinson Farm Agrifoods;	Western edge of K-Club;
Kerry Group Global Centre;	Bodenstown Graveyard (and proposal for new amenity);
Irish Commercials (and Volvo Trucks);	Gaelscoil Nás Na Ríogh;
Applegreen Millennium Park;	Piper's Hill Montessori School;
LIDL (Naas)	Piper's Hill College (Secondary School);
	St David's National School
	Killashee National School

Outlined below are details of potential impacts considered likely during the construction of Option C (Orange) according to each environmental effect, with a concluding paragraph summing up the overall impact on amenity. Given that the Proposed Project would be underground, there are no operational impacts anticipated on amenity.

The table below outlines the assessment ratings and associated justifications for each of the contributing environmental effects that, when in-combination, may result in an impact on amenity.



**Table 6.12: Ratings and Associated Justifications for Environmental Effects Contributing to Potential Impact on Amenity**

Air Quality	Noise (and vibration)	Visual	Traffic and Transport
Option C (Orange) is the shortest option and has the fewest number of receptors within 300m and within 50m of the route. It runs adjacent to three schools, with a total of five within 300m. Most of its length is classed as low or medium sensitivity areas, apart from around Mulhussey, which has a slightly higher receptor count due to the Proximity of St Joseph's National School, and is classed as high sensitivity area.	Relatively fewer noise sensitive receptors impacted compared to other options. Construction noise and vibration impacts temporary in nature, no permanent impacts expected.	(i) Potential for visual impacts at residential dwellings and along public roads. (ii) Potential visual impacts at Royal Canal View RC8 ('Jackson's Bridge' L5041) during construction and operational phases, but the magnitude of the impact is not likely to be greater Low. No significant visual impacts are anticipated.	Option C (Orange) is the shortest option and affects the least amount of regional roads (17%), reducing the overall amount of traffic affected. However the narrower local roads that will be used means there are greater amounts of full road closures. Impacts to local roads will be comparatively easier to divert than regional roads. It has the greatest amount of agricultural land impacted and lowest amount of properties within 0-50m (209). It passes the access to St. Joseph's National School in Mulhussey.

#### 6.2.4.1 Summary of Assessment

In relation to the assigned scoring for potential effects relating to Air Quality, Noise (and vibration), Visual and Traffic and Transport, it is considered likely that there is the potential for considerable but not significant impacts on amenity. Therefore, a scoring of '**Low-Moderate (Light Green)**' has been assigned. For more information in relation to the potential impacts of Option C (Orange) in relation to any of these environmental effects, please see Section 6.2.1 to Section 6.2.3.

**Low-Moderate**

#### 6.2.5 Health

The Study Area is largely considered to be 'marginally above average' in terms of the deprivation indices provided for my Pobal (Pobal, 2016<sup>52</sup>), however are some Electoral Divisions (EDs) within the Study Area are considered to be 'affluent', such as Maynooth, Straffan, Donaghcumper, Naas Rural, Ladytown, and Newtown. According to the Institute of Public Health (in Ireland), people in higher socio-economic groups are at lower risk of chronic conditions and associated disability than those in lower socio-economic groups (Institute of Public Health, 2020)<sup>53</sup>.

Using the outcomes of the amenity assessment as reported in Table 6.12, it is considered unlikely that the construction of Option C (Orange) would result in significant impacts on human health. This is primarily because processes and activities required during construction of the Proposed Project are temporary in nature, while the nature and scale of the Proposed Project means that construction activity would occur at any one location for a limited time; thereby not significantly impacting human health.

<sup>52</sup> <https://maps.pobal.ie/WebApps/DeprivationIndices/index.html>

<sup>53</sup> <https://publichealth.ie/wp-content/uploads/2020/04/20200416-AGEING-PUBLIC-HEALTH-MAIN.pdf>

### 6.2.5.1 Summary of Assessment

In light of the above findings, a scoring of '**Low (Cream)**' has been assigned for the consideration of potential impacts on Human Health.

Low

## 6.2.6 Employment and Economy

During construction and operation, potential impacts on employment and the national, regional and local economy are anticipated to be similar among each of the proposed route options given that they are all similar in nature, extent and scale, are located in close proximity to one another, and within the same Study Area.

The potential impacts on employment and the national, regional and local economy are the same as that outlined in Section 4.2.6.

### 6.2.6.1 Impacts on the Tourism Sector

Similarly to the potential impacts on employment and the national, regional and local economy, potential impacts on the tourism sector are anticipated to be similar among each of the proposed route options given they are all similar in nature, extent and scale, are located in close proximity to one another, and within the same Study Area.

The potential impacts on the tourism sector are the same as that outlined in Section 4.2.6.2.

## 6.2.7 Land-use (and Land-take)

Option C (Orange) is 46.7km in length, with the vast majority of its alignment being routed along regional and local roads between Woodland substation and Dunstown substation. Some sections of the route alignment are not routed along roadways however and are instead aligned across open agricultural land. Approximately 15.5km of Option C (Orange) is routed through open greenfield land, largely classed as 'pastures or non-irrigated land' according to 2018 Corine Land Class data. The impacts on agricultural land (including land-take) are considered in Section 6.2.8.

### 6.2.7.1 Summary of Assessment

Given the similarities around construction methodology and subsequent land-take requirements in respect to people and communities, the potential impacts in regard to land-use (and land-take) are the same as those outlined in Section 4.2.7 and thereby assigned a similar rating of '**Low (Cream)**'.

Low

## 6.2.8 Agriculture (including Equine)

The potential impacts on agriculture are addressed in general in Section 4.2.8. This Section addresses the impacts of Option C (Orange).

The Option C (Orange) crosses mineral soils along its entire length avoiding significant areas of peat to the west. From Woodland Substation to Dunstown Substation Option C (Orange) is the shortest overall option – 46.7km compared to 50.5km – 51.4km for the other route options. There are fifteen high sensitive enterprises located along Option C (Orange) – twelve equine enterprises and three dairy enterprises. Option C (Orange) will cross agricultural land for approximately 15.5km (33% of the entire length) and will cross the north east part of one very high sensitive stud farm in Rathasker and the centre of one very high sensitive stud farm in Moyglare.

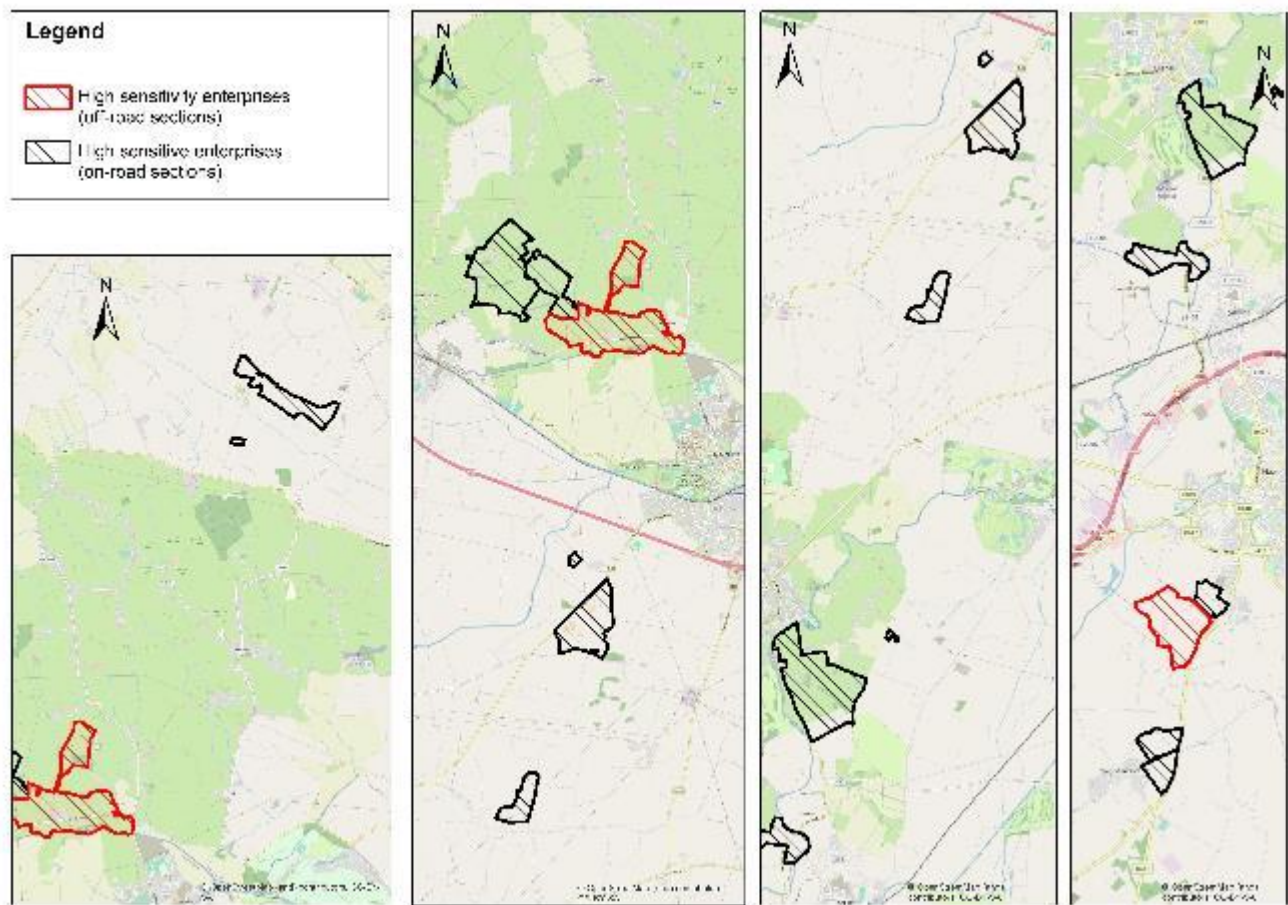


Figure 6-1: High sensitivity enterprises affected by Option C (Orange)

### 6.2.8.1 Summary of Assessment

The ranking score for Option C (Orange) is considered to be **Moderate (Dark Green)** given the moderate length across agricultural land and the moderate number of high sensitive enterprises it impacts.

**Moderate**

## 6.2.9 Utilities

There are numerous underground utilities in the regional road network between Woodland and Dunstown, including other electricity cables; telephone and broadband cables; sewers; and public and private water supplies. The public water supply is extensive in the area, with the network predominately using the road network for local residential supply while other larger mains being located off-road in agricultural land. There is no known group water supply with protected areas within the Study Area.

The assessment of Option C (Orange) has found that it crosses existing fibre cables (once), existing medium pressure gas pipelines (six times), existing water supply network (64 times) and existing wastewater network (four times). The count of crossing locations includes points within the same roads. For example Option C meets the medium-pressure gas network in five locations with multiple crossings within these sections. The four locations are at R148 (Kilcock to Maynooth); on the R403 (Clane to Straffan road); Millennium Parkway, R445, and R448 (roads within Naas). However, because of the layout of gas network crossing from one side of the road to the other, it is counted as six crossings.

It is expected that all utilities encountered during construction will either remain in-situ or, where absolutely necessary, appropriate diversions or modifications carried out (with the permission of the respective provider) so as to ensure disruption to surrounding communities is kept to a minimum. Any required service disruption will only be permitted for an agreed set period of time per day (generally a set number of hours) and will not be permitted to be continuous for full days at a time. Any required disruptions will be carefully planned so as to ensure that the duration of disruption is minimised in so far as is possible.

### 6.2.9.1 Summary of Assessment

Given the number of utility interfaces along the length of Option C (Orange), along with the potential for disruption to people and neighbouring communities, it is appropriate to assign a score of '**Low-Moderate (Light Green)**'.

Low-Moderate

## 6.3 Technical

As set out in Section 2.3.3, the topic areas under consideration to assist with determining the best route option are as follows:

- General Compliance with System Reliability, Security Standards;
- Headroom;
- Maintainability;
- Technology Operational Risk;
- Average Reliability Rates; and
- Repeatability.

### 6.3.1 General Compliance with System Reliability, Security Standards

This is EirGrid's reliability and security standards are defined in the Transmission System Security and Planning Standards and their Operation Security Standards.

All technical input to the Kildare Meath project will comply to EirGrid's Standards for Security and Reliability. Therefore, there is no differentiation between the proposed route options and route Option C has been assigned a score of 'Low (Cream)'.

Low

### 6.3.2 Headroom and Ratings Impact

Headroom is the amount of additional capacity each route option offers that would be available for the future without requiring further upgrade. All the proposed route options carry little additional headroom (spare current capacity) due to the nature of the corridor therefore giving no technical differentiation between the proposed routes in this aspect.

The current ratings bottleneck is the impact on the overall circuit ratings of the worst-case deepest obstacle crossing. As all the proposed route options will require some deep crossing solutions (below railways, motorways, rivers or a combination) of similar design, these will be the ratings bottleneck of that particular route. The connection spans north to south, whilst major natural and man-made obstacles are east west orientated, therefore all options cross the river Liffey, the railways, the M4, etc;

On account for the potential total number of Horizontal Directional Drills, Option C (Orange) has been assigned a score of **Low (Cream)**.

Low

### 6.3.3 Maintainability

This considers the ease with which the route option can be serviced and maintained, for example how easy it is to access joint bays and link boxes.

All the proposed route options will be developed with the same design principles. For example, maximum standing sheath voltages, typical trench cross-section, separation between joint bays, location of link boxes (underground in chambers or pillar mounted), same substation entry locations. Whilst some route options come with a greater proportion of off-road build as opposed to road, with the level of design detail available at this stage, is not possible to substantially differentiate between the proposed route options.

As there is no differentiation between the proposed route options and route Option C has been assigned a score of 'Low (Cream)'.

Low

### 6.3.4 Technology Operational Risk

This criterion aims to capture the risk of operating different technologies on the network.

The same technology is applied to all solutions including cables, joint bays, and bonding. All technology will be the standard technology in the industry and also the dominant technology on EirGrid's existing network (i.e. XLPE

insulated underground cables). Therefore, there is no differentiation between the proposed route options and route Option C has been assigned a score of '**Low (Cream)**'.

Low

### 6.3.5 Average Reliability Rates

This is the likelihood of the chosen cable technologies such as cables, joint bays, and bonding failing during operation. All cable technology listed above are common to all route options.

Industry data on Cross-Linked Polyethylene (XLPE) insulation technology indicates that cable failures on a statistical basis are related to cable length.

The proposed route options lengths are as per Table 4.17, Section 4.3.5 (all values are based on desktop surveys).

The small percentage difference between the lengths of the route option does not trigger any substantial increase in the risk of failure. Furthermore, there is not currently sufficient technical detail, at this point, to determine the number increase of joint bays of each route against the shortest (Option C).

Therefore, there is no discernible differentiation between the solutions and route Option C has been assigned a score of '**Low (Cream)**'.

Low

### 6.3.6 Repeatability

Repeatability is whether the proposed technical solution can be readily repeated in the transmission network.

All the proposed route options will be developed with the same design principles; therefore, all route options are easily repeatable across the transmission network. Therefore, there is no differentiation between the proposed route options and route Option C has been assigned a score of '**Low (Cream)**'.

Low

## 6.4 Deliverability

### 6.4.1 Design Complexity

There are 11 surface waterbodies crossed along the length of Option C (Orange), some of which crossed more than once; so there will be 18 crossings in total. These waterbodies will be crossed in a variety of different way in order to minimise the environmental impacts, and to ensure construction and operational efficiency. Option C (Orange) has the highest amount of off-road sections, thus interface with private assets is increased. The difficulties associated with the increased agricultural land including reinstatement works increase the overall complexity.

The utilities crossings are assessed in Section 6.2.9 of this report. Option C meets the medium-pressure gas network in five locations with multiple crossings within these sections. The four locations are at R148 (Kilcock to Maynooth); on the R403 (Clane to Straffan road); Millennium Parkway, R445, and R448 (roads within Naas).



Option C (Orange) will require eight major crossings (such as HDD), which is the same number as Option D (Blue) and more than Options A (Red) and B (Green). The two additional crossings are on the River Liffey – a major river and a sensitive receptors these crossings will be of particular complexity.

Option C has been assigned a score of **High (Dark Blue)**.

High

## 6.4.2 Traffic Disturbance

For Option C (Orange) it is anticipated that full road closures might be required at the following locations:

- L6207 from Ribstown through Cullendragh to Barstown Junction with the R156 an overall distance of 2,460 meters. In this location the carriageway is between 2.5 and 4.0 meters wide and does not allow adequate space for vehicles to pass the construction works safely;
- R125 from Mullagh Junction with the R156 through the Kiltens Gap Junction and Ferrestown Graveyard to Bryanstown, an overall distance of 6,670 meters. On this section of the route option the carriageway width is between 2.5 and 4.0 meters at the tightest section. It is therefore, recommended a full road closure. Note the road does increase to 12 meters in isolated areas and could present isolated opportunities to implement a lane closure;
- Moyglare Stud Farm to Moyglare Junction, a distance of 160 meters where the road width is between 2.5 and 3.5 meters wide;
- Timard to Laraghbryan West, a distance of 1,150 meters where the road with is between 2.5 and 3.5 meters wide;
- Smithstown to Longtown, an overall distance of 2,860 meters along roads of 2.5 to 5.7 meters wide which are not wide enough to set up lane closures;
- Irish Town Lower to Longtown South an overall distance of 270 meters with a road width between 2.7 and 4.7 meters;
- From Blackhall via Bodenstown Graveyard to the Junction with the R407, a distance of 2,290 meters. The road width reduces to a minimum of 2.3 meters. It is noted that the road width does increase to 10 meters in some areas so it expected that lane closures could be invoked instead of full road closure in isolated areas;
- Rasker Road to the Junction with the R448, a distance of 610 meters where the road width is between 2.8 and 5 meters wide. Therefore, not allowing a lane closure and requiring a full road closure; and
- At the end of Option C from the Stephenstown South Junction the R412 through to the Dunstown Substation including turn off, a distance of 1,240 meters with a road width of 3.0 meters. The construction works will take up most of the width of the road, therefore, requiring a full road closure.

In other areas of Option C (Orange); the road width will be reduced to 6.0 meters by the proposed construction works. In these areas it is anticipated that a lane closure with diversions for HGV vehicles may be required:

- Jenkinstown Junction to the Mullagh junction of the R156 and R125, a total distance of 2,810 meters; and
- R448 Junction with Rathasker Road and the Stephenstown South junction, a total distance of 3,730 meters.

All the remaining roads along the route of Option C (Orange) may require lane closures with the correct traffic management in place to allow the construction works to be carried out safely, specifically:

- From Junction R407 to Sallins Bypass;



- From Sallins Bypass to M7 South; and
- From Jigginstown to Rathasker Road.

Table 6.13 below provides a high-level summary on the proposed traffic management plans during installation for Option C (Orange). It is recommended that following the selection of the proposed route option, a detailed analysis to be undertaken with regards to phasing of road closures.

**Table 6.13: Summary of Option C Traffic Management**

Option C	Total Length (in km)	Lane Closures (in km)	HGV Diversions (in km)	Road Closures (in km)	Field Crossings (in km)
	46.7	6.9 (14.9%)	6.5 (13.9%)	20.3 (43.4%)	15.5 (33%)

In terms of traffic disturbance, a High score has been assigned to Option C (Orange) based on the Traffic Management which is anticipated to be required during construction works.

For Option C (Orange), in each route section requiring a lane closure ‘with’ or ‘without’ HGV, diversions are mostly available while at all times maintaining access for local residents. It is anticipated though that on a few route sections requiring full closure there might not be suitable diversions for through traffic along the length of the option.

Where suitable diversions for through traffic are available along the length of the option, the average installation rate is anticipated to be 80 meters per day, resulting in approximately two years to install this route option.

The exact location of the cable trench will be defined later in the project and this will depend on further design, surveys, consultation, and assessment. Consultations with the local authorities will help to define where the cable trench will go in the road to minimise disruption. For example, if a safe alternative could be provided for access with significant disruption for pedestrians, a footpath could be used to minimise disruption to the road network.

Option C (Orange) is the shortest of the options and is mainly located along local roads and agricultural lands. The lower number of regional roads affected would reduce the overall amount of traffic affected, although the narrower width of the local roads might require as a result a greater number of full road closures. Impacts to local roads will be comparatively easier to divert than regional roads. In terms of traffic disturbance related to the Traffic Management, Option C (Orange) has been assessed as **Moderate-High (Light Blue)**.

**Moderate-High**

### 6.4.3 Dependence on Other Infrastructure Projects

As outlined in Chapter 1 of this report, all route options will have the same dependence on works required at the associated substations in terms of connections. In terms of other infrastructure projects in the area, similar crossing of existing motorways, railways and canals are required. All four of the proposed route options will cross the same infrastructure but, in some cases, in different locations. All four options will cross or run parallel with utilities, including water mains and the low to medium pressure gas network.

All four of the proposed route options will cross the proposed Water Supply Project<sup>54</sup> and therefore it is not a differentiator at this point.

Options B (Green), Option C (Orange), and Option D (Blue) will cross the proposed DART+ West railway line at the crossing point of the Dublin Sligo railway line. This project proposes the electrification and re-signalling of the Maynooth line and construction of a new DART depot facility west of Maynooth for the maintenance and parking of trains. West of Maynooth, the rail track will be upgraded to a twin-track between Maynooth and the proposed depot. This twin track configuration will divert offline to the south, running parallel to the existing railway on the approach to the proposed depot. The planning application is expected to be made to An Bord Pleanála in 2022, with construction possible in 2025. At this location, it is proposed that Options B (Green), Option C (Orange), and Option D (Blue) will cross the existing railway line by major crossing (such as HDD). The proposed DART+ West project will require a long crossing and additional studies and shielding to ensure that there are no electro-magnetic forces issues between the Proposed Project and the electrified line. At this stage, it is not considered that there would be any conflicts between the two projects, and both could be constructed without significant constraint. It is possible that both projects would be at construction at the same time and additional consideration would be needed to the cumulative effects, if Options B (Green), Option C (Orange), or Option D (Blue) were selected as the Emerging Best Performing Option.

Option C (Orange) has been assessed as **Moderate (Dark Green)** in terms of dependence on other infrastructure projects.

Moderate

#### 6.4.4 Permits and Wayleaves

At this stage of the assessment all route options will have a similar issue with permits. However, Option C (Orange) has the largest amount of off-road sections and will have greatest requirements for wayleaves.

Option C (Orange) has been assessed as **Moderate-High (Light Blue)**.

Moderate-High

#### 6.4.5 Implementation Timelines

This route option is the shortest of all route options and requires the least amount of excavation and thus will reduce in programme durations. The route option however affects the most agricultural land, which will increase the risk of working on the land during inclement weather, requiring extended periods for reinstatement. This will likely increase the timelines for the construction period.

Option C (Orange) has been assigned a score of **Moderate-High (Light Blue)**.

Moderate-High

<sup>54</sup> <http://www.watersupplyproject.ie/>

## 6.4.6 Combined Deliverability Performance

Considering the design complexity, traffic disturbance, and implementation timelines, a rating of **'High' (Dark Blue)** has been assigned. Option C (Orange) has scored very highly in terms of Traffic Disturbance (due to closures of local roads) and Design Complexity (due to the increased number of major crossings (such as HDDs), crossing of the River Liffey and potential increase impact to private assets). It has score Moderate-High (Light Blue) in terms of Implementation Timelines and Permits and Wayleaves (due to the longer lengths through agricultural land).

High

## 6.5 Economic

As set out in Section 2.3.4, the topic areas under consideration to assist with determining the best route option are as follows:

- Length of installed cable;
- Quantity of Minor and Major service crossings; and
- Number of Major Crossings (such as Horizontal Directional Drills.)

### 6.5.1 Length of Installed Cable

The first economic assessment is from the overall lengths of the cable routes (presented in Table 4.17, Section 4.3.5). From this, route Option C has a total length of 46.7 km which is the shortest route and therefore it has the lower economic impact in this aspect.

For this reason, route Option C has been assigned a score of **Low (Cream)**.

Low

### 6.5.2 Quantity of Crossings

An assessment of both the minor and major crossings expected to be encountered for the cable route options has been carried out by categorising them into the different crossing types (presented in Section 2.3.3.2). Summaries of these are listed below where Type 1 has the lowest impact and Type 4 has the highest:

- Type 1 Crossings - shallow crossings (utility/drainage/other) - deeper installation;
- Type 2 Crossings - shallow water crossings (Open cut solution);
- Type 3 Crossings - larger water crossings (Cable bridges/culverts/micro tunnels); and
- Type 4 Crossings - large crossings (Horizontal directional drills/ Auger bores or tunnel solutions)

It has been found that route Option C (Orange) has the joint most Type 1 crossings, the second most Type 2 crossings, no Type 3 and joint most Type 4. For this reason, route Option C (Orange) has been assigned a score of **Moderate-High (Light Blue)**.

Moderate-High

## 6.6 Summary of Option C (Orange) Assessment

### 6.6.1 Environment Summary

Option C (Orange) has been scored as **Low-moderate (Light Green)** overall. The environment assessment topic scores for Option C (Orange) were generally lower than Option A (Red) and similar to those scored for Option B (Green) and that is reflected in the similar combined performance score as Option B (Green). In comparison to Option B (Green), Option C (Orange) scores higher in terms of Land Use Planning (impacts to a solar farm application) but less in terms of cultural heritage. A summary of the environmental appraisal of Option C (Orange) is provided in Table 6.14.

**Table 6.14: Summary of Environment Assessment for Option C (Orange)**

Biodiversity	Soils and Water	Planning Policy and Land Use	Landscape	Archaeology, Architectural Heritage, and Cultural Heritage	Combined Environment Score
Moderate-High	Low-Moderate	Low-Moderate	Low-Moderate	Low-Moderate	Low-Moderate

### 6.6.2 Socio-Economic Summary

Option C (Orange) is considered to have a similar in-combination social impact to Option A (Red) and Option B (Green), however individual social impacts are more similar to Option B (Green) than Option A (Red). As such, it has been assigned a **Moderate (Dark Green)** score. A summary of the socio-economic appraisal of Option C (Orange) is provided in Table 6.15.

**Table 6.15: Summary of Socio-economic Assessment for Option C (Orange)**

Traffic and Transport	Noise and Vibration	Air Quality	Visual	Amenity	Health	Employment and Economy (and Tourism)	Land Use (and Land-take)	Agriculture (including Equine)	Utilities	Combined Socio-Economic Score
Moderate-High	Low-Moderate	Low	Low-Moderate	Low-Moderate	Low	Low	Low	Moderate	Low-Moderate	Moderate

### 6.6.3 Technical Summary

At this stage in the Proposed Project are there no technical differentiations apart from the number of major crossings. Options A (Red) and B (Green) will have two fewer than Options C (Orange) and D (Blue). Other technical factors will have no impact on the selection of the best performing option. Option C (Orange) has been assessed to have a **Low-Moderate (Light Green)** score for the technical criterion.

**Table 6.16: Summary of Technical Assessment for Option C (Orange)**

General Compliance	Headroom	Maintainability	Technology Operational Risk	Average Reliability Rates	Repeatability	Combined Technical Score
Low	Low	Low	Low	Low	Low	Low

### 6.6.4 Deliverability Summary

Considering the design complexity, traffic disturbance, and implementation timelines, a rating of **High (Dark Blue)** has been assigned. Option C (Orange) has scored very highly in terms of Traffic Disturbance (due to closures of local roads) and Design Complexity (due to the increased number of major crossings (such as HDDs), crossing of the River Liffey and potential increase impact to private assets). It has score Moderate-High (Light Blue) in terms of Implementation Timelines and Permits and Wayleaves (due to the longer lengths through agricultural land).

**Table 6.17: Summary of Deliverability Assessment of Option C (Orange)**

Design complexity	Traffic disturbance	Dependence on other infrastructure projects	Permits and wayleaves	Implementation Timelines	Combined Deliverability Score
High	Moderate-High	Moderate	Moderate-High	Moderate-High	High

### 6.6.5 Economic Summary

At this stage in the Proposed Project, the only differentiations between route options are cable route lengths and the impact from the quantity of expected major crossings. Option C (Orange) has been assessed to have a **Low-Moderate (Light Green)** score for the economic criterion due to the high number of major crossings (such as HDD) while having shortest route length.

**Table 6.18: Summary of Economic Assessment of Option C (Orange)**

Length of Installed Cable	Quantity of Crossings	Combined Economic Score
Low	Moderate-High	Low-Moderate

## 7. Option D (Blue)

This section outlines the assessment of Option D (Blue) against the five assessment criteria – Environment; Socio-Economic; Technical; Economic; and Deliverability and their sub-topics.

### 7.1 Environment

As set out in Section 2.3.1, the 'Environment' criterion assessment topics under consideration to assist with determining Emerging Best Performing Option are as follows:

- Biodiversity (Flora and Fauna);
- Soils and Water;
- Planning Policy and Land Use;
- Landscape; and
- Archaeology, Architectural Heritage, and Cultural Heritage.

#### 7.1.1 Biodiversity (Flora and Fauna)

##### 7.1.1.1 European Sites

Option D (Blue) is not located within or directly adjoins any European site. The nearest European site is Rye Water/Cartron SAC located approximately 2km to the south-east of Option D (Blue) and designated for petrifying springs with tufa formation, narrow-mouthed whorl snail and Desmoulin's whorl snail (Appendix A.1). Option D (Blue) is also hydrologically connected to this European site and has the closest river crossing (approximately 2.2km upstream following the course of the waterbody) to the site out of all the options via the Rye Water River. This route option requires 18 river crossings however involves the second shortest length of off-road section. This route option involves crossing of watercourses with indirect hydrological links to a complex of European sites within Dublin Bay including South Dublin Bay and River Tolka Estuary SPA and South Dublin Bay SAC also (see Appendix A.1). There is the potential for impacts to aquatic habitats and species downstream through a pollution event during construction. Habitats along the southern section of Option D (Blue) (as with all other route options) are suitable to support foraging qualifying interests bird species from Poulaphouca Reservoir SPA and are within the foraging range of QI bird species. Therefore, there is the potential for disturbance impacts to these species and temporary loss of habitat during construction.

##### 7.1.1.2 National Sites

No NHA sites are located in close proximity to this route option. The closest NHA site is Hodgestown Bog NHA located 8km west of Option D (Blue). This route option also directly crosses the Royal Canal pNHA west of Maynooth and the Grand Canal pNHA on two occasions at Sallins and Naas however HDD will be employed at these major crossings and therefore impacts to aquatic receptors will be minimised or avoided.

##### 7.1.1.3 Watercourses and Aquatic Species

This route option involves the crossing of several major rivers including Rye Water, River Liffey, Lyreen River and tributaries of the River Tolka with varying water framework directive (WFD) status's ranging from 'Good' to 'Poor'. This route option potentially involves the most crossings of major rivers (seven crossings) requiring HDD and nine smaller rivers and streams requiring alternative crossing methods such as open cut if not designated as a salmonid watercourse. These rivers are important for aquatic species and otter. Atlantic salmon and brown trout are found in the River Liffey and the Rye Water River along with minnow, European eel and lamprey sp. White-clawed crayfish

has been recorded at Leixlip within the Rye Water River. Several rivers were noted to be suitable to support kingfisher with one bird recorded hunting along the River Liffey during field surveys.

#### 7.1.1.4 Recent Field Survey Data and Desk Based Review

A drive over comprising visual assessments and targeted spot checks at static locations was undertaken along the accessible sections of the route option on the 11<sup>th</sup>, 12<sup>th</sup> and 13<sup>th</sup> of October 2021. The dominant habitats recorded along Option D (Blue) include hedgerows, treelines, agricultural grassland, tillage land (predominantly cereal production), amenity grassland and watercourses. A number of red listed (snipe) and Annex I (kingfisher and golden plover) bird species were recorded during visit one of the wintering bird surveys in October 2021. Devil's bit scabious, the food plant of the Annex II listed marsh fritillary butterfly, was recorded near Dunstown substation within Harristown Common.

A search of the National Biodiversity Data Centre records included records for several protected species including common frog, pine marten, common lizard, red squirrel, badger and otter in the vicinity of Option D (Blue). A number of records of wintering bird species at Poulaphouca and across counties Meath and Kildare were returned as part of a data request received from Birdwatch Ireland approximately 8km from Option D.

As with Options A (Red), Option B (Green), and Option C (Orange), the routing of Option D (Blue) traverses along narrow road networks bordered by hedgerows and treelines and there will be a requirement for vegetation removal to accommodate the cable installation. Given the presence of species rich hedgerows and mature tree lines along these road networks and throughout the off-road sections there is the potential for habitat loss, habitat fragmentation and impacts on protected species, wintering and breeding birds through disturbance, habitat loss and pollution during construction. Given the distance of the route option there is a high likelihood that invasive non-native species listed on the Third Schedule of the E C (Birds and Natural Habitats) Regulations will be encountered along the road networks. All lengths of the proposed route option not in the road surface has the potential for impacts on biodiversity.

#### 7.1.1.5 Summary of Assessment

As with Option A (Red), Option B (Green), and Option C (Orange), the greatest effects on biodiversity for Option D (Blue) would be during construction, where despite cables primarily being laid in public roads, there is potential (particularly from passing bays and watercourse crossings) for impacts on hedgerows, tree lines and aquatic ecosystems in particular; other habitats and species may also be disturbed or fragmented during the construction phase and effects could be permanent in some cases. In the absence of mitigation there is the potential for impacts to Rye Water/Carton SAC in the event of a pollution incident during construction.

There is considered to be a **Moderate-High (Light Blue)** risk of a significant impact to biodiversity assets due to Option D (Blue).

**Moderate-High**



## 7.1.2 Soils and Water

### 7.1.2.1 Geology and Soils

Option D (Blue) is underlain predominantly by Carboniferous limestone bedrock, with associated calcareous shales, and older Silurian greywacke, siltstone and shale in the south of the Study Area. There are no mapped karst landforms or Geological Heritage sites recorded in the vicinity of the route option. However, the option route crosses rocks in which karst features have been recorded and the potential exists for unmapped features to occur in proximity to the route option. Karst features are associated with the dissolution of limestone and the formation of ground cavities, which may not always be apparent at the surface, with consequent subsidence risks and enhanced subsurface drainage.

Superficial deposits underlying the Option D (Blue) route are predominantly glacial tills, derived from the underlying limestone and, in the north, sandstone and shale bedrock. There is also alluvium associated with watercourses and some areas of sand and gravel are crossed by the route in the southern half of the Study Area.

The route option crosses areas of potential geologic economic deposits (sand and gravel, granular aggregate and crushed rock), predominantly in the southern half of the Study Area. A slightly greater area of potential deposits lies under Option D (Blue) than the other proposed route options, however, the areas crossed are still small and these deposits are widely available in the surrounding area, so that this is not considered a significant constraint for route selection. One mine is recorded within 200 m of the Option D route (to the south of Maynooth), no further details were available at the time of this assessment and this will need to be further investigated at later stages.

### 7.1.2.2 Summary of Assessment

In terms of geology and soils the overall evaluation for Option D (Blue) is ranked as **Low-moderate** risk based on currently available information. However, the potential for unmapped karst features should be noted and further assessment may be needed to identify potential for ground stability issues.

**Low-Moderate**

### 7.1.2.3 Groundwater

The majority of Option D (Blue) lies within the Dublin (poorly productive bedrock) WFD groundwater body, with a small area in the north within the Dunshaughlin (productive fissured bedrock) groundwater body. In the south of the Study Area the route option crosses the Naas (karstic) and Curragh Gravels East (gravel) groundwater bodies.

The majority of the route option is underlain by bedrock classified as Locally Important Aquifer (bedrock which is generally moderately productive in local zones), with a small area of Regionally Important Aquifer - Karstified (diffuse) crossed in the southern half of the Study Area. Some areas classified as of High groundwater vulnerability are crossed by the route option, predominantly in the southern half of the Study Area, along with some small areas of Extreme groundwater vulnerability. While there are no mapped karst landforms in the vicinity of the route option, the route option crosses rocks in which karst features have been recorded and the potential exists for unmapped features to occur. Karst features can be associated with significant groundwater flowpaths and may be important in supporting surface water features.

There are no Public & Group Supply Source Protection Areas or Group Water Schemes in the vicinity of the route option. There are a large number of groundwater wells and springs mapped by the Geological Survey Ireland across

the Study Area. However, in accordance with TII guidance<sup>55</sup> and the observation that low yielding wells, used mainly for domestic and farm water supply, are very common in Ireland, the assessment has focused on high-yielding springs and wells used for public water supply and their surrounding protection zones and the total number of wells and springs along each route corridor has not been used in assessing relative impacts between route options.

No groundwater dependent water bodies or groundwater dependent terrestrial ecosystems (GWDTEs) have been identified at this stage of assessment, so these features have not been used in assessing relative impacts between route options at this stage. However, the potential exists for such features to be present within the Study Area and it cannot be conclusively determined at this stage whether or not they may be a constraint for the proposed route.

There is potential for dewatering operations associated with crossings of large watercourses, major roads and railways. This applies to all route options so no specific issues have been identified for Option D (Blue) at this stage.

### 7.1.2.4 Summary of Assessment

In terms of groundwater the overall evaluation for Option D (Blue) is ranked as **Low-moderate** risk based on currently available information. However, the potential for unmapped karst features should be noted and further assessment may be needed to identify potential for interference with groundwater flows and potential for groundwater flooding issues.

**Low-Moderate**

### 7.1.2.5 Surface Water

There are 11 surface waterbodies crossed along the length of route Option D. Some are crossed more than once. A full list of water bodies and their current status is provided in Table 7.1 as well as their proximity to the Rye Water Valley/Carton SAC, their sensitivity to change, the likely crossing technique to be employed and the potential for impacts as a result.

**Table 7.1 Surface Water Bodies Option D (Blue)**

Waterbody	Status	Number of Crossings	Connection & Proximity to Rye Water Valley/Carton SAC (at closest crossing)	Sensitivity	Impact Potential
Liffey_100	Moderate	2	No Connection	Medium	Low
Grand Canal Naas Line	Good	1	No Connection	Very high	Low
Grand Canal Main Line	Good	1	No Connection	Very high	Low
Liffey_120	Good	3	No Connection	Very high	Low
Liffey_130	Good	3	No Connection	Very high	Medium
Lyreen_020	Poor	2	3.2km	High	High
Royal Canal Main Line	Good	1	No Connection	Very high	Low
Rye Water_020	Moderate	1	3.3km	High	High
Rye Water_030	Moderate	2	2km	Very High	Medium

<sup>55</sup> TII. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes. Unreferenced. Obtained from: [www.tii.ie/technical-services/environment/planning/](http://www.tii.ie/technical-services/environment/planning/) (accessed October 2021). TII guidelines have been used as they are relevant to all linear infrastructure projects.

Waterbody	Status	Number of Crossings	Connection & Proximity to Rye Water Valley/Carton SAC (at closest crossing)	Sensitivity	Impact Potential
Dunboyne Stream_010	Moderate	1	No Connection	Medium	Low
Tolka_020	Poor	1	No Connection	Low	Low
Total		18			

In addition to water bodies being directly crossed by the cable, for Option D (Blue) there are also a number in close proximity which may be at risk from silty water runoff or spillages of hydrocarbons during construction. These water bodies are less than 50m from the cable route:

- Liffey\_120: the route option runs alongside this water body, at approximately 10m to 50m from the bank edge, for 420m close to Bodenstown Golf Club and then again a short distance upstream from this point the route option is approximately 50m from the water body for a stretch of 220m. The Liffey\_120 is of very high sensitivity and, whilst the cable will be laid in the road in these locations, it is likely the road drains to the water body and so a pathway for contaminants exists. There is a medium to high impact potential from having a trench in such close proximity for this length.
- Rye Water\_020: the route option runs alongside this water body, at approximately 25m from the bank edge, for 140m. The Rye Water\_020 is of high sensitivity and there is a medium to high impact potential from having a trench in such close proximity for this length.

### 7.1.2.6 Flood Risk

For this route option, the length (in metres) within a PFRA flood risk area is:

- Pluvial: 303m; and
- Fluvial: 2,654m.

There are 18 crossings of water bodies along the route; all crossings will be designed so do not present an increase in flood risk, either pluvial or fluvial.

### 7.1.2.7 Summary of Assessment

Considering the number of crossings of water bodies (approximately 18 no.), in particular the crossings of those with high or very high sensitivities, as well as the potential for open cut crossings in addition to potential flood risk, Option D (Blue) is ranked as **Moderate risk (Green)** in respect to the Soils and Water assessment topic.

**Moderate**

## 7.1.3 Planning Policy and Land Use

### 7.1.3.1 Planning Policy and Legislation

Option D (Blue) follows the same route as Option B (Green) and Option C (Orange) until Mulhussey, where it follows the Moyglare Road south then east, rejoining the same route as Option B (Green) and Option C (Orange) to the south west of Moyglare Stud Farm. It then diverges again from Option B (Green) and Option C (Orange) at the M4 motorway to the south west of Maynooth, following the road until Dowdstown, and then follows the R406 to Barberstown. There it heads south west before skirting Clane, where it interacts with a number of Clane LAP zonings to the north east of the town. The route option then follows the R407 to Bodenstown, joining with the other route

options to the north west of Sallins. It then follows the same path as Option A (Red), passing through Naas West and East before joining the rest of the routes at Killashee and heading south towards Dunstown substation.

#### 7.1.3.1.1 Clane Local Area Plan 2017 - 2023

Option D (Blue) follows the R403 towards Clane, turning off just before the town heading south east through Clapdoo Commons, crossing three areas of land zoned within the Clane LAP before crossing the Liffey. The zoning objectives for these lands are contained within the table below.

**Table 7.2: Relevant Zoning Objectives Clane LAP**

Zoning Objectives (Clane Local Area Plan 2017 - 2023)	
F2: Strategic Open Space	To preserve, provide for and improve recreational amenity, open space and green infrastructure networks.
SR: Strategic reserve	To protect strategic lands from inappropriate forms of development which would impede the orderly expansion of a strategic urban centre.
I : Agricultural Land	To retain and protect agricultural uses.

Option D (Blue) also passes through Key Development Area 1 (KDA 1), the vision for which is as follows:

*'The extension of the urban area of Clane through new residential development and open space and amenity, with a high quality permeable urban form, which protects natural heritage and delivers important connectivity to the River Liffey and to the future town park.'* (P.62)

#### 7.1.3.1.2 Draft Naas Local Area Plan 2021-2027

Option D (Blue) crosses the railway line (Dublin-Cork) and M7 motorway before entering Millennium Park and via R407, traversing through the commercial park to join the R409 through Naas West before travelling south via the R448 through Naas East. The following zonings applicable to Millennium Park, Naas West and Naas East.

**Table 7.3: Relevant Zoning Objectives Naas LAP**

Zoning Objective (Naas Local Area Plan 2021-2027)	
B Existing/Infill Residential	To protect and enhance the amenity of established residential communities and promote sustainable intensification.
C(1) New Residential	To provide for new residential development.
E Community & Education	To provide for education, recreation, community and health
F(2) Strategic Open Space	South of Kilcullen and Ballymore Eustace Roundabouts: These lands comprising 11.94 ha are identified for the development of a proposed active recreation area catering for the future population of this area of town. The development of such facilities shall include the provision of strong links to existing and future residential lands in the surrounding area, as well as the development of the old Naas-Baltinglass/Tullow railway line Greenway.
F3 Strategic Open Space	To preserve, provide for and improve recreational amenity, open space and green infrastructure networks.
H Industry and Warehousing	To provide for industry, manufacturing, distribution and warehousing.
H(5) Industry and Warehousing	To provide for industry, manufacturing, distribution and warehousing.
H(9) Industry and Warehousing	To provide for industry, manufacturing, distribution and warehousing.
I Agriculture	To retain and protect agricultural uses.
K(2) Commercial/Residential	To provide for commercial and appropriate residential mixed-use developments.

Zoning Objective (Naas Local Area Plan 2021-2027)	
P1 Data Centre /Warehouse	To provide for Data Centre development and their associated infrastructure only.
Q4 Office, Enterprise and Employment	To provide for and facilitate the provision of high job-generating uses.
Q5 Office . Enterprise and Employment	To provide for and facilitate the provision of high job-generating uses.
U Utilities	To provide for and improve public utilities

### 7.1.3.2 Planning Applications

A review of all granted and live applications over the last five years has been performed within a 50m buffer, 25m either side of Option D (Blue). Some of these applications will be new receptors which will have already been constructed by the time construction on the Proposed Project commences. These include both individual dwellings and larger development as shown in the LAPs. Of these, some of the notable applications are highlighted in the table below.

**Table 7.4: Notable Planning Applications in proximity to Option D (Blue)**

Local Authority	App. Number	Brief Description	Address	Status
Kildare County Council	16434	New right hand turning lane, bus set down area and associated works, a lift to existing 110kv overhead power lines, removal of derelict prefabricated structures and culvert of ditch within the site and the construction of a 10,450sqm two and three storey 1000 pupil post-primary school and associated infrastructure including, ESB substation, 92 car park spaces, 250 cycle parking spaces, bus and car set down and pick up facilities, and play areas	Plots No. 71 and 72 and part Plots 85 and 86 of the Millennium Park Master Plan, Millennium Park Naas	Granted 09/06/2017
Kildare County Council	161145	183 no. residential dwellings comprising 16 no. 2-two storey terrace dwellings (Type A); 134 no. 3-bed two storey terrace and semi-detached dwellings (Type A1 & B) and 33 no. 4-bed two storey semi-detached and detached dwellings (Type C, C1 & C2); provision of a single storey childcare facility (approximately 324sq.m GFA); and all associated infrastructure.	Jigginstown, Naas, Co. Kildare	Granted 16/06/2017
Kildare County Council	17886	an amendment to previously permitted residential development Reg. Ref. 16/1145. The proposed amendments relate to 83 No. units only, representing Phase 1 and 2 of the permitted scheme, and comprises of minor modifications to elevational treatments, together with all other associated and ancillary modifications at a site	Jigginstown, Naas, Co. Kildare.	Granted 09/11/2017
Kildare County Council	191269	Change of use of existing warehouse building to light industry/workshop use together with new single storey extension. Entrance alterations, on-site parking and associated site works and infrastructure.	Mylerstown, Two Mile House, Naas	Granted 02/06/2020
Kildare County Council	20840	the construction of a 5627sqm Specialist Packaging Single Storey High Level Manufacturing Facility with Three Storey Head office and associated infrastructure	Millennium Business Park, Osberstown, Naas	Granted 30/03/2021 (under financial appeal)
Kildare County Council	201564	(a) Extension of the existing 7.3m wide two-lane carriageway by 137m to the north (b) 2m grass verge, 2m cycle path and 2m footpath east and west of the proposed access road extension (c) vehicular entrance west of the proposed extension to facilitate a	Millennium Park, Osberstown, Naas	Granted 01/07/2021

Local Authority	App. Number	Brief Description	Address	Status
		proposed access to a planned commercial development (Kildare Co.Co. Ref. 20840) (d) vehicular entrance east of the proposed extension to facilitate a proposed access to a planned commercial development (Kildare Co.Co. Ref. 20561) (e) parking provision and associated infrastructure		
Kildare County Council	19305701	STRATEGIC HOUSING DEVELOPMENT (ABP Decision) - the demolition of an existing dwelling and agricultural buildings on the subject site and the construction of a residential development of 314 no. dwellings, a crèche (c. 610sqm), retail unit (c. 169sqm)	Naas West & Jigginstown, Naas	Granted 13/03/2020

These applications, as well as the more minor/domestic applications, will be taken into account in the routing of the cable. Other larger scale planning applications will also be examined and taken into account within the routing process. Such applications include other energy projects, the Water Supply Project, and road schemes.

### 7.1.3.3 Summary of Assessment

Taking the above into account, Option D has the potential to interact with a significant number of recent and current planning applications, as well as zonings within the Clane and Draft Naas LAPs. However, it is acknowledged that with appropriate siting and mitigation, the impacts of these interactions can be minimised. Therefore, Option D has been assigned moderate risk in terms of the combined impacts to land use and planning policy.

Moderate

## 7.1.4 Landscape

### 7.1.4.1 Landscape character

Refer to Section 4.1.4.1 for full information on landscape character.

### 7.1.4.2 Landscape elements

No designated or highly sensitive landscape elements were identified within the portion of the Study Area that occurs within County Meath.

Included in Table 14.4 of Chapter 14 (and indicated on Map 14.2) of the Kildare County Development Plan are:

*'12 "principal landscape sensitivity factors": Major Rivers and Water bodies; Canals; Ridgelines; Green Urban Areas; Broad-Leaved Forestry; Mixed Forestry; Natural Grasslands; Moors and Heathlands; Agricultural Land with Natural Vegetation; Peat Bogs; Scenic View; and Scenic route.'*

This option will pass within 300m of the following 'principal landscape sensitivity factors' (from north to south):

- River Liffey; and
- Woodland R412 regional road.

#### 7.1.4.2.1 Sensitivity - landscape elements

The sensitivity of these 'principal landscape sensitivity factors' are recorded in Table 7.5.

#### 7.1.4.2.2 Magnitude of impacts - landscape elements

The magnitude of impacts on landscape elements are as follows:

- River Liffey:** Approximately 8.7km of the route option passes within an area of '*special sensitivity*' that buffers the River Liffey '*principal landscape sensitivity factor*'. This area would have a heightened sensitivity to the removal of vegetation. Within this '*principal landscape sensitivity factor*' approximately 9km of the route occurs within agricultural fields; thus, the construction activity here would be uncharacteristic, however, works will be temporary and transitory. For these reasons, the magnitude of impact during the construction phase is deemed to be low. The agricultural land use will be reinstated and the river crossing is likely to be by directional drilling; therefore the likely magnitude of effect during the operational phase is likely to be negligible.
- Woodland R412 regional road:** It is likely that the R412 regional road is wide enough to accommodate the trenching work without the need to remove roadside vegetation; therefore, there will be no material change. Thus the magnitude of effect is deemed to be negligible during both the construction and operational phases.

#### 7.1.4.2.3 Significance of impacts - landscape elements

All the impacts on the '*principal landscape sensitivity factors*' identified are of a negligible magnitude during the operational phase; therefore, are considered, by default, to have a significance of effect that is **Imperceptible**. During the operational phase only the River Liffey '*principal landscape sensitivity factor*' is likely to have a significance of **Slight-Imperceptible**, while for all the others, it will be **Imperceptible**.

**Table 7.5: Summary - Principal Landscape Sensitivity Factors within County Kildare**

Principal Landscape Sensitivity Factor	Specific feature	Sensitivity of feature		Likely operational magnitude of effect	Likely operational significance of effect
Major Rivers and Water bodies	River Liffey	High-	medium	Negligible	Imperceptible
Mixed Forestry	Woodland R412 regional road	High		Negligible	Imperceptible

#### 7.1.4.3 Summary of Assessment

A 9km offline section passes through agricultural fields near the River Liffey '*Principal Landscape Sensitivity Factor*'; therefore, there is a potential for some impact on the landscape character within this area of '*special*' sensitivity, but significant impacts are not anticipated. No significant landscape impacts are anticipated. Whilst the magnitude of impact during both construction and operation is at the very bottom end of the magnitude spectrum; some receptors are deemed to have a sensitivity that is at the upper end of the sensitivity spectrum thus a relatively small increase in the magnitude of impact during the construction phase could result in a significant impact therefore the attributed score is **Low-Moderate (Light Green)**.

**Low-Moderate**



## 7.1.5 Archaeology, Architectural Heritage, and Cultural Heritage

Option D (Blue) includes sections common to Option A (Red), Option B (Green), and Option C (Orange), and therefore the receiving environment is similar to that described in Sections 4.1.5, 5.1.5, and 6.1.5 above.

A summary of archaeology, architectural heritage, and cultural heritage constraints identified within the Step 3 Study Area is presented in the Environmental Constraints Report along with a discussion on the general character and nature of the constraints present, comprising National Monuments and Preservation Orders, sites on the RHM, Recorded Monuments and sites recorded on the SMR, Protected Structures, structures recorded on the NIAH, ACAs, and GDLs identified by the Survey of Historic Gardens and Designed Landscapes.

Baseline information on the archaeology, architectural heritage and cultural heritage constraints identified within 100m of Option D (Blue) is provided in Appendix B.1.

### 7.1.5.1 Archaeology

The Jigginstown Castle complex, comprising one National Monument (AY\_39; also a Protected Structure, AH\_16) and three sites with Preservation Orders placed on them (AY\_40, AY\_42, and AY\_43), is located approximately 40m to the west of Option D (Blue). The complex includes two further sites with Preservation Orders placed on them (AY\_38, AY\_44; also a Protected Structure, AH\_17) approximately 195m and 230m to the west of Option D (Blue), respectively. Five of these sites (AY\_38, AY\_39, AY\_42, AY\_43, and AY\_44; see Appendix B.1), are also on the RHM.

Three Recorded Monuments are located within 100m of Option D (Blue) (see Appendix B.1). These comprise the site of a medieval parish church (AY\_09), the site of medieval domestic activity (AY\_11), and the site of a castle (AY\_28) of unknown date.

A total of 18 sites recorded on the SMR have been identified within 100m of Option D (Blue). These are characterised by the locations of cropmarks (AY\_10, AY\_15 – 16, AY\_18, AY\_19, AY\_21 – 22, AY\_23, AY\_32 – 34, AY\_35, AY\_36 and AY\_46 – 48), a medieval bawn wall (AY\_20), and evidence of post-medieval religious activity (AY\_08).

Further information on the archaeological constraints identified within 100m of Option D (Blue) is included in in Appendix B.1.

#### 7.1.5.1.1 Archaeological Potential

Option D (Blue) crosses the Rye Water, River Lyreen and the River Liffey, as well as a number of minor watercourses with the potential for votive (religious) offerings to be present. The underlying geology is largely limestone, with superficial deposits of till, gravel and alluvium, which has the potential to preserve previously unknown archaeological monuments and remains.

### 7.1.5.2 Architectural Heritage

Architectural heritage constraints within 100m of Option D (Blue) comprise:

- Six Protected Structures characterised by post-medieval churches (AH\_03; also included on the NIAH) and dwellings (AH\_07, AH\_08 and AH\_18), including estate buildings (AH\_14) and a castle (AH\_09).
- Seven GDLs comprising six recorded by the Survey of Historic Gardens and Designed Landscapes and one identified from historic mapping (Ordnance Survey 6", 1837 – 1842).

No ACAs are located within 100m of Option D (Blue).

Further information on the architectural constraints identified within 100m of Option D (Blue) is included in Appendix B.1.

### **7.1.5.3 Cultural Heritage**

A total of 24 cultural heritage sites identified within 100m of Option D (Blue) from the sources identified in Section 2.3.1.5. These are characterised by extant post-medieval buildings and structures, including stone road bridges, vernacular housing and farm buildings, as well as cropmarks corresponding with post-medieval field systems. Further information on these cultural heritage sites is presented in Appendix B.1.

### **7.1.5.4 Potential Impacts**

#### **7.1.5.4.1 Construction – Direct Impacts**

##### **Archaeology**

No direct impacts have been identified on National Monuments, sites with Preservation Orders, or sites on the RHM as a result of the construction of Option D (Blue).

Where Option D (Blue) is located within the Zone of Notification associated with a Recorded Monument, this has been identified as a direct impact below. While the option would not directly impact the Recorded Monument itself, excavation of the cable trench and joint bays would have a direct impact on any archaeological remains that may survive within this zone.

Option D (Blue) is located within the Zone of Notification of one Recorded Monument (AY\_09). Within this zone it is located in the carriageway of the existing road the construction of which is more than likely to have removed or truncated any archaeological remains associated with this monument that may have been present. However, construction, including the excavation of the cable trench and joint bays would have a direct impact on any archaeological remains that may survive. Construction would also have a direct impact on any archaeological remains associated with this Recorded Monument that may survive within any additional land take required for construction.

While construction would be within the existing carriageways may have partially removed or truncated any remains associated with, the option has the potential to remove archaeological remains associated with AY\_08, AY\_15, AY\_35, and AY\_46 – 48, construction of Option D (Blue) would have a direct impact on any archaeological remains associated with these constraints that may survive. In addition construction would have a direct impact on any unknown archaeological remains associated with these constraints that may survive within any additional land take required for construction.

The excavation of the cable trench and joint bays would have a direct impact through the removal of any archaeological remains associated with AY\_10 (an enclosure) which is located in an offline section in Laraghbryan East.

Excavation of the cable trench and joint bays, and the excavation of temporary launch and reception pits for directional drilling may also result in a direct impact any previously unknown archaeological remains that may be present within the land required for Option D (Blue). The potential for this impact is considered to be higher in previously undeveloped areas than within the existing carriageways, the construction of which is likely to have likely to have removed or truncated any archaeological remains that may have been present.

### Architectural Heritage

Should Option D (Blue) require additional land take for construction, the removal of boundary features would have a direct impact six GDLs (Jenkinstown House; DL\_02, Killashee House; DL\_20, Blackhall; DL\_16, Castlesize; DL\_18, Dollardstown House; DL\_08, and Dowdstown House; DL\_09).

### Cultural Heritage

One post-medieval road bridge (CH\_01) is located on the existing road through Culcommon. There is therefore potential for a direct impact on this cultural heritage constraint as a result of accidental damage from construction plant.

The excavation of the cable trench and joint bays may have a direct impact through the removal of any surviving remains associated with three cultural heritage sites (CH\_08, CH\_36 and CH\_40).

CH\_03 is a public house located immediately adjacent Option D (Blue). There is therefore potential for a direct impact on this cultural heritage constraint as a result of accidental damage from construction plant.

#### 7.1.5.4.2 Construction - Indirect Impacts

### Archaeology

Option D (Blue) is located approximately 40m to the east of the boundary of Jigginstown Castle complex, which comprises a National Monument (AY\_39) and five sites with Preservation Orders (AY\_38, AY\_40, AY\_42, AY\_43, and AY\_44) (five of which are also sites on the RHM), and two Protected Structures (AH\_16 and AH\_17). Noise and visual intrusion from construction plant may have an indirect impact on this complex. However, it is anticipated any intrusion would be temporary (lasting the duration of construction in this location) and would be largely screened by the intervening mature trees along the eastern boundary of the complex which would be retained.

### Architectural Heritage

This route option is located within 87m the following six Protected Structures<sup>56</sup>:

- Saint Paul's Church of Ireland Church (AH\_03, assessed by the NIAH to be of Regional importance);
- Greygates (AH\_07);
- Barberstown House (AH\_08);
- Barberstown Castle (AH\_09);
- the gate lodge and entrance of Castlesize House (AH\_14); and
- Bluebell Farm House (AH\_18).

While these potential impacts would result from the introduction of noise and visual intrusion into the setting of these constraints during construction from the movement and operation of plant, it is anticipated any intrusion would be temporary (lasting the duration of construction in each location).

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<sup>56</sup> Please note, indirect impacts have been identified on two additional Protected Structures (AH\_16 and AH\_17); however, these form part of the Jigginstown Castle complex and have been considered alongside the archaeological constraints that form this group.

## Cultural Heritage

Movement and operation of plant during the construction of Option D (Blue) would have an indirect impact on the setting of nine cultural heritage sites (CH\_03, CH\_13, CH\_29, CH\_34, CH\_45, CH\_55, CH\_57, CH\_58, and CH\_59). However, it is anticipated any intrusion would be temporary (lasting the duration of construction in each location).

### 7.1.5.4.3 Operational Impacts

As the Proposed Project would be located beneath the road surface, and any offline sections would be reinstated after construction no impacts on archaeological, architectural or cultural heritage constraints have been assessed as a result of the operation of Option D (Blue).

### 7.1.5.5 Summary of Assessment

While some potential impacts are comparable to the other route options, Option D (Blue) has the potential to directly impact seven sites identified on the SMR and given the proximity of this route option to the Jigginstown Castle complex, there is the potential for an indirect impact on this historically significant constraint. Due to these potential impacts, Option D (Blue) has been assigned a risk of **'Moderate (Dark Green)'**.

#### Moderate

A Route Corridor Summary Matrix for archaeology, architectural heritage and cultural heritage is provided in Appendix B.1.

As the project progresses it may be possible to avoid impacts on archaeology, architectural heritage, and cultural heritage constraints through design, including localised realignments of the route. Where impacts on archaeology, architectural heritage, and cultural heritage constraints cannot be avoided it is possible impacts could be reduced through recording in advance of, or during, construction, including the archiving and documentation of the results of this recording for public reference.

## 7.2 Socio-Economic

### 7.2.1 Traffic, Transport and Access

Option D (Blue) passes close to Maynooth before crossing the M4 and following the R406 and R403, the R407 and the R448 between the Woodland and Dunstown substations. The route option is mainly located along regional and local roads, bypassing the towns of Clane and Sallins before re-joining the regional road network at Naas and passing close to residential areas in the south-west of the town.

Table 7.6 presents the break-down of road classifications for the route of Option D (Blue).

**Table 7.6: Option D (Blue) Road Classification**

Option	Total Length (km)	Road Length Percentage Distribution		
		Regional	Local Roads and Smaller	Off-road and other Land Types
Option D	50.5	45.7	31.5	22.8

Option D (Blue) for the most part is located along regional roads for approximately 46% of its length and has some off-road sections along the route, in particular west of Maynooth and east of Clane. It affects the least amount of

agricultural land compared to the other route options and its proposed alignment crosses a total of six waterways, which is a relatively high number compared to the other alternatives.

It is anticipated that during the installation of cable works, construction would extend through some key junctions and roundabouts along Option D (Blue), which could have significant impact in traffic disturbance. These locations are described in section 7.4.2 Deliverability. There might be a requirement to divert traffic, particularly at congested junctions and areas which may give rise to more complex traffic management plans during the construction phase. Traffic management measures would be assessed on a case-by-case basis for each signalised junction and standard roundabout. The number of the key junctions along Option D (Blue) is the lowest compared to the other route options.

Option D (Blue) has the highest number of properties impacted compared to the other options within 0 to 50 meters of its centreline which as a result would have the more traffic disruption to access – approximately 445. The number of properties impacted are in part due to the route along the R403, Irishtown and through part of Naas. Access will also be de disrupted to St. Joseph's National School, TLC Centre Nursing Home, and five schools along the R448, south of Naas. Its alignment also passes the entrance to a large Storage Facility (Kennedy Clane).

### 7.2.1.1 Summary of Assessment

Option D (Blue) is the third longest of the options. It is mainly located along regional roads (roughly 46% of its length). The use of regional roads will generally affect more traffic as these types of roads are busier than local roads. However their use allows less full road closures as regional roads are generally wider and so lane closures with temporary traffic lights/stop-go systems can be put into place. Full road closures will result in more disruption through diversions. Mitigation measures through consultation and traffic management will reduce the impacts. The measures can include ensuring that the works do not disrupt access to the nursing home and the schools. Phasing of the works will be important to minimise disruption. This can be done by ensuring that works are completed at less busy times and are carefully planned to avoid road users being disrupted in multiple locations by construction teams in one journey. These measures will be designed at the next step in the Proposed Project. Its proposed alignment has the highest number of properties within 0 to 50 meters of its centreline and passes five schools. In terms of risk of traffic disruption, the Traffic, Transport and Access for Option D (Blue) is assessed to be **Moderate-High (Light Blue)**.

Moderate - High

## 7.2.2 Noise, Vibration and Air Quality

### 7.2.2.1 Noise and Vibration

#### 7.2.2.1.1 Baseline

Option D (Blue) passes close to Maynooth before crossing the M4 and following the R406 and R403, the R407 and the R448 between the Woodland and Dunstown substations. The route option is mainly located along regional and local roads, bypassing the towns of Clane and Sallins before rejoining the regional road network at Naas and going close to residential areas in the south-west of the town. There are some off-road sections in this route option, in particular west of Maynooth and east of Clane. Offline or off-road sections are sections where the route option does not follow alongside a road but cuts across, for example, agricultural land.

Baseline noise levels are likely to vary along this route option with higher noise levels likely closer to transport infrastructure and during periods of peak transport activity. The main noise source along this route option is from

road traffic noise. Environmental Protection Agency (EPA) traffic noise data for Round 3 contained in EPA Maps<sup>57</sup> shows that traffic noise levels will be highest where the route option crosses the M4 and the M7 and where it runs alongside regional roads.

EPA railway noise data shows that where the route crosses the Dublin to Cork railway line rail noise levels are elevated.

### 7.2.2.1.2 Methodology

The noise and vibration assessment at this stage of the Proposed Project involves gaining an appreciation of the baseline noise environment close to each of the proposed route options and identifying noise and vibration sensitive receptors within distance bands up to 300m from each of the proposed route options. Noise impacts from construction activities do not normally occur beyond 300m and vibration impacts do not normally occur beyond 100m. The locations of major crossings where Horizontal Directional Drilling (HDD) is likely to be required and off-road sections where noise impacts are likely to be greater compared to on-road sections is also used to assess each route option in terms of the noise risk according to the multi criteria analysis at Step 4A. The risk scale is as follows:

- High: dark blue;
- Moderate-high: blue;
- Moderate: dark green;
- Low-moderate: green; and
- Low: cream.

No baseline noise surveys were undertaken, and no noise modelling was undertaken at this stage of the Proposed Project.

### 7.2.2.1.3 Noise and Vibration Sensitive Receptors

Table 7.7 shows the residential property counts in distance bands up to 300m from the proposed route option. Overall, there are a total of 2802 properties within 300m of the proposed route.

**Table 7.7: Residential Property Counts within 300m of Option D (Blue)**

Option	No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	No. of sensitive receptors 100-200m	No. of sensitive receptors 200-300m	Total no. of receptors within 300m
Option D	445	384	874	1099	2802

As well as residential properties there are other sensitive receptors within 300m of the proposed route option which are not included in the above counts including:

- St. Joseph’s National School;
- Gaelscoil Nás Na Ríogh School;
- St David’s National School;
- Piper’s Hill College;
- Killashee National School; and
- Several equine operations.

<sup>57</sup> <https://gis.epa.ie/EPAMaps/>

#### 7.2.2.1.4 Potential Noise and Vibration Impacts

##### Areas of Potential Horizontal Directional Drilling (HDD)

There is greater potential for adverse noise and/or vibration impacts at sensitive receptors where construction activities would occur over a longer period, e.g. at trenchless crossings. It is recognised that certain construction activities at certain trenchless crossings could be required to take place outside of normal working hours, which would increase the likelihood of adverse noise effects occurring. In addition, certain potential trenchless crossing techniques that may be employed (e.g. HDD) also have the potential to cause adverse vibration effects at nearby receptors.

There is potential for adverse impacts at receptors within 300m of HDD works and there could be eight major crossings on Option D (Blue). An initial assessment has shown there are the potential for adverse noise impacts at the Royal Canal Main Line, the Dublin-Sligo Railway line, the M4 Motorway, the Dublin-Cork railway line, and the M7 Motorway.

##### Offline sections

For the majority of the proposed route, the underground cables are expected to be installed using 'Open Cut' techniques. Where 'Open cut' works are undertaken adjacent to the existing road network, there is a relatively low potential for temporary impacts due to construction noise. This is due to the relatively high levels of local environmental noise that are typically experienced adjacent to roads. Also, as the works are expected to progress in sections, noise levels at any receptor would only be elevated for a relatively short period of time. However, where 'Open cut' works are undertaken in relatively quiet areas (such as offline sections) close to sensitive receptors there is the potential for temporary impacts due to construction noise.

Table 7.8 shows the total length, the total offline length and whether there are receptors within 300m of the offline route for Option D (Blue).

**Table 7.8: Total length and offline length for Option D**

Option	Total Length (km)	Offline Length (km)	Receptors within 300m of offline section
Option D	50.5	9.0	Yes

The table shows that the route goes offline for around 9km of its total length where there is the potential to result in noise increases at receptors within 300m.

#### 7.2.2.1.5 Summary of Assessment

There are relatively large numbers of receptors within 300m of Option D (Blue), there is 9km of potential offline construction activity and there are receptors within 300m of potential major crossings such as HDD works at eight crossing points with the potential for experiencing adverse noise and/or vibration effects, therefore it is appropriate to give a score of **Moderate (Dark Green)**.

**Moderate**



## 7.2.2.2 Air Quality

### 7.2.2.2.1 Baseline

Option D (Blue) passes close to Maynooth before crossing the M4 and following the R406 and R403, the R407 and the R448 between the Woodland and Dunstown substations. The route option is mainly located adjacent to regional and local roads, bypassing the towns of Clane and Sallins before re-joining the regional road network at Naas and going close to residential areas in the south-west of the town. There are some offline sections (i.e. not within roads) in this route, in particular west of Maynooth and east of Clane.

Baseline air pollutant concentrations are likely to vary along this route due to the difference in emissions between the rural and urban environment. Higher concentrations are likely closer to transport infrastructure and where the route is closer to larger settlements. The main air quality sources along this route are from road traffic, particularly where the route crosses the M4 and the M7.

The Air Quality Index for Health across the Study Area<sup>58</sup> is Good (with an index score ranging from 1-3). The majority of the Study Area, as defined by the EPA<sup>59</sup>, is located within Air Quality Zone D – Rural Ireland apart from locations in Naas, which are within Air Quality Zone C – other cities and large towns.

### 7.2.2.2.2 Sensitive receptors

Human and ecological receptors are consistent with those listed in Section 4.2.2.3.

The Institute of Air Quality Management (IAQM) dust guidance<sup>60</sup>, has been adapted for the purposes of this assessment. The number of residential properties and schools have been counted and identified as receptors. Table 7.9 shows the human receptor count within 300m of each of Option D (Blue).

**Table 7.9: Residential Property Counts within 300m of Option D (Blue)**

Option	No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	No. of sensitive receptors 100-200m	No. of sensitive receptors 200-300m	Total no. of receptors within 300m
Option D	445	384	874	1099	2802

As well as residential properties there are other sensitive receptors within 300m of the proposed route option which are not included in the above counts including:

- St. Joseph's National School;
- Gaelscoil Nás Na Ríogh School;
- Killashee National School;
- St David's National School; and
- Piper's Hill College.

<sup>58</sup> Environmental Protection Agency (EPA), Air Quality Index for Health, <https://airquality.ie/information/air-quality-index-for-health>, accessed October 2021.

<sup>59</sup> Environmental Protection Agency (EPA), Air Quality Zones, <https://airquality.ie/information/air-quality-zones>, accessed October 2021.

<sup>60</sup> Institute of Air Quality Management. 2016. Guidance on the assessment of dust from demolition and construction. Version 1.1. <http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf>

With regard to ecological receptors, Option D (Blue) crosses the Royal Canal pNHA and crosses the Grand Canal pNHA twice. Therefore, these are in close proximity (i.e. less than 20m) from the route.

#### 7.2.2.2.3 Assessment Criteria

The main criteria used for the assessment of each option is set out in Section 4.2.2.3.3.

#### 7.2.2.2.4 Potential Impacts

The potential impacts are consistent with those set out in Section 4.2.2.3.4.

Table 7.10 shows the number of receptors, the sensitivity to dust soiling and the risk score.

**Table 7.10: Potential air quality impact for Option D (Blue)**

No. of sensitive receptors 0-50m	No. of sensitive receptors 50-100m	Sensitivity of section to dust soiling	Risk score
445	384	Medium	2

For Option D (Blue) most of its length is classed as medium sensitivity areas apart from around Mulhussey and around Naas, which have a slightly higher receptor count and are classed as high sensitivity areas. Therefore, it is appropriate to give a score of low-moderate (green).

#### 7.2.2.2.5 Summary of Assessment

Option D (Blue) is the second longest option and Option D (Blue) has the largest number of receptors within 50m of the route option. Option D (Blue) passes through the southwest of Naas and runs adjacent to five schools. Option D (Blue) crosses over two pNHA (Royal Canal pNHA and Grand Canal pNHA (twice)). Therefore, an overall risk score of **Moderate (Dark Green)** has been applied.

**Moderate**

## 7.2.3 Visual

There is the potential for visual impacts at scenic designations, residential dwellings and along public roads, with scenic designations carrying a greater potential for risk.

### 7.2.3.1 Scenic designations

No scenic designations were identified within the portion of the Study Area that occurs within County Meath.

Included in Table 14.4 of Chapter 14 (and indicated on Map 14.2) of the Kildare County Development Plan are:

*'12 "principal landscape sensitivity factors": Major Rivers and Water bodies; Canals; Ridgelines; Green Urban Areas; Broad-Leaved Forestry; Mixed Forestry; Natural Grasslands; Moors and Heathlands; Agricultural Land with Natural Vegetation; Peat Bogs; Scenic View; and Scenic route.'*

This route option will pass within 300m of the following 'principal landscape sensitivity factors' (from north to south):

- Royal Canal View RC8 ('Jackson's Bridge' L5041);
- Designated scenic route (34) ('Views to Lyons Hill, Liffey Valley and Oughterard');

- River Liffey view RL5 ('Alexandra Bridge'); and
- Grand Canal view (stone bridge crossing the Grand Canal between the R445 and the R409 regional roads).

#### 7.2.3.1.1 Sensitivity - scenic designations

The sensitivity of these '*principal landscape sensitivity factors*' are recorded in Table 7.5.

#### 7.2.3.1.2 Magnitude of impacts - scenic designations

**Royal Canal View RC8 ('Jackson's Bridge' L5041):** There is a direct line of sight from the bridge towards the canal crossing point of this route c.300m away, but there is existing high voltage overhead line crossing the canal at c.150m so the view is already characterised by infrastructure. Construction activity is likely to be visible from this bridge; therefore, the magnitude of impact during the construction phase is deemed to be low, but during the operational phase, it is deemed to be low-negligible as a crossing such as a cable bridge (to be determined at next step of the project) may be visible.

**Designated scenic route ((34)'Views to Lyons Hill, Liffey Valley and Oughterard')**: This view is orientated towards the distant mountains to the South and Southwest. At this section of the route, the cable will be underground below the R403 regional road, so no change material change to the view; therefore, the likely magnitude of impact is deemed to be negligible during both the construction and operational phases.

**River Liffey view RL5 ('Alexandra Bridge')**: At this section of the route option will be offline in agricultural fields close to the existing low voltage overhead line. This field is within the River Liffey '*Principal Landscape Sensitivity Factor*'. Construction activity would be uncharacteristic within the available view of the agricultural fields but it will be transitory and temporary; therefore, the magnitude of impact during the construction phase will be low. During the operational phase, it may be possible to see joint bays in the view; however, if the design of the locations of the joint bays is undertaken with consideration of the view from this designated scenic view, the magnitude of impact is likely to be negligible during the operational phase.

**Grand Canal view (stone bridge crossing the Grand Canal between the R445 and the R409 regional roads):** At this section of the route, the cable will be underground below the regional road, so no change material change to the view; therefore, the likely magnitude of impact is deemed to be negligible during both the construction and operational phases.

#### 7.2.3.1.3 Significance of impacts - scenic designations

The effects on the Royal Canal View RC8 ('Jackson's Bridge' L5041) '*principal landscape sensitivity factor*' are of a low magnitude during the construction phase; therefore, are considered to have a significance of impact that is **Slight**, while for all the others, it will be **Imperceptible**. Operational phase impacts at Royal Canal View RC8 ('Jackson's Bridge' L5041) will reduce to a low-negligible magnitude; therefore the significance is considered to be **Slight**.

**Table 7.11: Summary - Principal Landscape Sensitivity Factors within County Kildare – scenic designations**

Principal Landscape Sensitivity Factor	Risk - Direct Impacts (Constraints Study)	Risk – Impacts Within 300m (Constraints Study)	Specific feature	Sensitivity of feature	Likely operational magnitude of effect	Likely operational significance of effect
Scenic View	High	Moderate-High	Royal Canal View RC8 ('Jackson's Bridge' L5041)	High	Low-Negligible	Slight
Scenic View	High	Moderate-High	River Liffey view RL5 ('Alexandra Bridge')	High	Negligible	Imperceptible
Scenic View	High	Moderate-High	Grand Canal view (stone bridge crossing the Grand Canal between the R445 and the R409 regional roads)	High	Negligible	Imperceptible
Scenic route	High	Moderate-High	Designated scenic route (34) ('Views to Lyons Hill, Liffey Valley and Oughterard')	High	Negligible	Imperceptible

### 7.2.3.2 Summary of Assessment

The assessment of the potential or significant visual impacts as a result of Option D (Blue) can be summarised by the following points:

- Potential for visual impacts at residential dwellings and along public roads.
- Potential visual impacts at Royal Canal View RC8 ('Jackson's Bridge' L5041) during construction and operational phases, but the magnitude of the impact is not likely to be greater Low.
- Potential visual impacts at River Liffey designated scenic view at 'Alexandra Bridge' during construction phases, but the magnitude of the impact is not likely to be greater Low and assuming there will be no new permanent above-ground elements introduced into the view, the magnitude of the impact will be negligible during the operational phase, therefore, no significant visual impacts are anticipated.

As such, the attributed score is **Low-Moderate (Light Green)**.

**Low-Moderate**

### 7.2.4 Amenity

This section outlines the likely impact on the amenity of residential, commercial, community (and recreational), and tourism receptors, collectively, by way of consideration of contributing environmental effects. Issues of access and severance are outlined in Section 7.2.1. All residential, commercial, and community (and recreational) receptors are shown in Figure C.1.4 in Appendix C.1.

The alignment of Option D (Blue) passes through both rural and urban areas along its length, as outlined in Section 3.2.4. Table 7.12 lists the known commercial and community receptors that are situated immediately adjacent to the route alignment (this list is not exhaustive but represents a high-level analysis for the purposes of informing the Step 4A selection process). No tourism receptors (i.e. receptors whose main function is aimed at visitors to its locality) were encountered immediately adjacent to the alignment of Option D (Blue), while one-off or ribboned residential receptors are located along all sections of the route (outwith off-line sections). Option D (Blue) is also routed in close proximity or within a number of built-up areas, such as passing along the southern extent of Maynooth, through parts of Straffan as well as the western and southern side of Naas.

**Table 7.12: Known Commercial and Community Receptors Adjacent to the Alignment of Option D (Blue)**

Commercial receptors:	Community receptors:
Barstown Business Park; Hatchet Inn (and associated filling station); Lavins (Ice Cream Distributor); Sean Doyle Auctioneers; John Lee Furniture; Moyglare Manor; Maynooth Business Park; Straffan Antiques; Barberstown Castle (Hotel); Friel's of Straffan; DB Coatings Ltd.; Maynooth Used Cars; Kennedy International Transport; Kerry Group Global Centre; Irish Commercials (and Volvo Trucks); Applegreen Millennium Park; ALDI (Naas); Europcar (Naas); Chadwicks Builders Providers	St Joseph's National School; TLC Centre Maynooth (Nursing Home); Naas Sports Centre (playground and skatepark) Enable Ireland Kildare Children's Services; Naas United Football Club Gaelscoil Nás Na Ríogh; Piper's Hill Montessori School; Piper's Hill College (Secondary School); St David's National School Killashee National School

Outlined below are details of potential impacts considered likely during the construction of Option D according to each environmental effect, with a concluding paragraph summing up the overall impact on amenity. Given that the Proposed Project would be underground, there are no operational impacts anticipated on amenity.

Table 7.13 outlines the assessment ratings and associated justifications for each of the contributing environmental effects that, when in-combination, may result in an impact on amenity.

**Table 7.13: Ratings and Associated Justifications for Environmental Effects Contributing to Potential Impact on Amenity**

Air Quality	Noise	Visual	Traffic and Transport
<p>Option D has the largest number of receptors within 50m of the route. Option D (Blue) is the second longest option and Option D (Blue) has the largest number of receptors within 50m of the route option. Option D (Blue) passes through the southwest of Naas and runs adjacent to five schools.</p>	<p>Relatively greater number of noise sensitive receptors impacted compared to other options. Construction noise and vibration impacts temporary in nature, no permanent impacts expected.</p>	<p>(i) Potential for visual impacts at residential dwellings and along public roads.(ii) Potential visual impacts at Royal Canal View RC8 ('Jackson's Bridge' L5041) during construction and operational phases, but the magnitude of the impact is not likely to be greater Low. (iii) Potential visual impacts at River Liffey designated scenic view at 'Alexandra Bridge' during construction phases, but the magnitude of the impact is not likely to be greater Low and assuming there will be no new permanent above-ground elements introduced into the view, the magnitude of the impact will be negligible during the operational phase. No significant visual impacts are anticipated.</p>	<p>Option D (Blue) is within regional road for approximately 46% of its length. It has the highest number of properties within 0-50m of its route (445) and so there will be more disruption to access. The number of properties is in part due to the route along the R403 (Irishtown) and through part of Naas. Access will also be disrupted to, St. Joseph's National School, TLC Centre Nursing Home, and five schools (along the R448, south of Naas). Also passes the entrance to a large Storage Facility (Kennedys Clane). This route has the least amount of road closures/HGV diversions.</p>

### 7.2.4.1 Summary of Assessment

In relation to the assigned scoring for potential impacts relating to Air Quality, Noise (and vibration), Visual and Traffic and Transport, it is considered likely that there is the potential for significant impacts on amenity. Therefore, a scoring of '**Moderate-High (Light Blue)**' has been assigned. For more information in relation to the potential impacts of Option D (Blue) in relation to any of these environmental effects, please see Section 7.2.1 to Section 7.2.3.

**Moderate-High**

### 7.2.5 Health

The Study Area is largely considered to be 'marginally above average' in terms of the deprivation indices provided for 'my Pobal' (Pobal, 2016), however there are some Electoral Divisions (EDs) within the Study Area are considered to be 'affluent', such as Maynooth, Straffan, Donaghcumper, Naas Rural, Ladytown, and Newtown. According to the Institute of Public Health (in Ireland), people in higher socio-economic groups are at lower risk of chronic conditions and associated disability than those in lower socio-economic groups (Institute of Public Health, 2020).

Using the outcomes of the amenity assessment as reported in Table 7.13, it is considered unlikely that the construction of Option D (Blue) would result in significant impacts on human health. This is primarily because processes and activities required during construction of the Proposed Project are temporary in nature, while the nature and scale of the Proposed Project means that construction activity would occur at any one location for a limited time; thereby not significantly impacting human health.

In light of the above findings, a scoring of '**Low-Moderate (Light Green)**' has been assigned for the consideration of potential impacts on Human Health.

**Low - Moderate**

## 7.2.6 Employment and Economy

During construction and operation, potential impacts on employment and the national, regional and local economy are anticipated to be similar among each of the proposed route options given that they are all similar in nature, extent and scale, are located in close proximity to one another, and within the same Study Area.

The potential impacts on employment and the national, regional and local economy are the same as that outlined in Section 4.2.6.

### 7.2.6.1 Impacts on the Tourism Sector

Similarly to the potential impacts on employment and the national, regional and local economy, potential impacts on the tourism sector are anticipated to be similar among each of the proposed route options given they are all similar in nature, extent and scale, are located in close proximity to one another, and within the same Study Area.

The potential impacts on the tourism sector are the same as that outlined in Section 4.2.6.2.

## 7.2.7 Land-use (and Land-take)

Option D (Blue) is 50.5km in length, with the vast majority of its alignment being routed along regional and local roads between Woodland substation and Dunstown substation. Some sections of the route alignment are not routed along roadways however and are instead aligned across open agricultural land. Approximately 9km of Option D (Blue) is routed through open greenfield land, largely classed as 'pastures or non-irrigated land' according to 2018 Corine Land Class data. The impacts on agricultural land (including land-take) are considered in Section 7.2.8.

Given the similarities around construction methodology and subsequent land-take requirements in respect to people and communities, the potential impacts in regard to land-use (and land-take) are the same as those outlined in Section 4.2.7 and thereby assigned a similar rating of '**Low (Cream)**'.

**Low**

## 7.2.8 Agriculture (including Equine)

The potential impacts on agriculture are addressed in general in Section 4.2.6. This Section addresses the impacts of Option D (Blue).

The Option D (Blue) crosses mineral soils along its entire length avoiding significant areas of peat to the west. From Woodland Substation to Dunstown Substation there are fifteen high sensitive enterprises located along Option D (Blue) – twelve equine enterprises, two dairy enterprises and one poultry enterprise. Option D (Blue) will cross agricultural land for approximately 9km (18% of the entire length) and will cross the northern part of one very high sensitive stud farm in Blackhall and the southern edge of one very high sensitive stud farm in Moyglare.



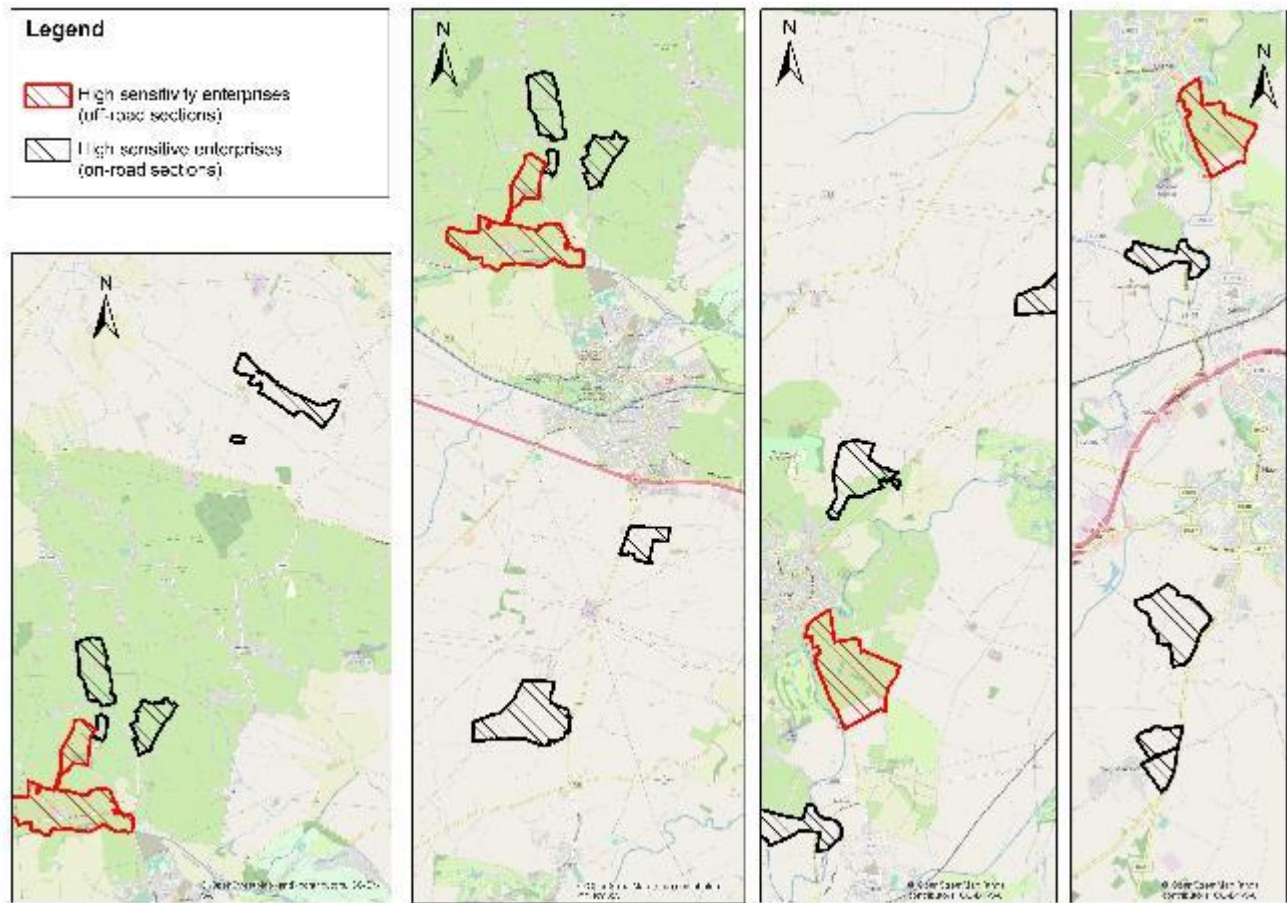


Figure 7-1: High sensitivity enterprises affected by Option D (Blue)

### 7.2.8.1 Summary of Assessment

The ranking score for Option D (Blue) is considered to be 'Low-Moderate' given the moderate length across agricultural land and the low-moderate number of high sensitive enterprises it impacts.

Low-Moderate

### 7.2.9 Utilities

There are numerous underground utilities in the regional road network between Woodland and Dunstown, including other electricity cables; telephone and broadband cables; sewers; and public and private water supplies. The public water supply is extensive in the area, with the network predominately using the road network for local residential supply while other larger mains being located off-road in agricultural land. There is no known group water supply with protected areas within the Study Area.

The assessment of Option D (Blue) has found that it crosses existing 38kV underground cables (twice), existing fibre cables (8 times), existing medium pressure gas pipelines (33 times), existing water supply network (94 times) and existing wastewater network (23 times). The count of crossing locations includes points within the same roads. For example Option D meets the medium-pressure gas network in seven locations with multiple crossings within

these sections. The seven locations are at R148 (Kilcock to Maynooth); One the R406 (Maynooth to Straffan road), on the R403 (Clane to Straffan road); on the R407 (Clane to Naas Road), and Millennium Parkway, R445, and R448 (roads within Naas). However, because of the layout of gas network crossing from one side of the road to the other, it is counted as 33 crossings.

It is expected that all utilities encountered during construction will either remain in-situ or, where absolutely necessary, appropriate diversions or modifications carried out (with the permission of the respective provider) so as to ensure disruption to surrounding communities is kept to a minimum. Any required service disruption will only be permitted for an agreed set period of time per day (generally a set number of hours) and will not be permitted to be continuous for full days at a time. Any required disruptions will be carefully planned so as to ensure that the duration of disruption is minimised in so far as is possible.

Given the number of utility interfaces along the length of Option D (Blue), along with the potential for disruption to people and neighbouring communities, it is appropriate to assign a score of '**Low-Moderate (Light Green)**'.

**Low-Moderate**

## 7.3 Technical

As set out in Section 2.3.3, the topic areas under consideration to assist with determining the best route option are as follows:

- General Compliance with System Reliability, Security Standards;
- Headroom;
- Maintainability;
- Technology Operational Risk;
- Average Reliability Rates; and
- Repeatability.

### 7.3.1 General Compliance with System Reliability, Security Standards

This is EirGrid's reliability and security standards are defined in the Transmission System Security and Planning Standards and their Operation Security Standards.

All technical input to the Kildare Meath project will comply to EirGrid's Standards for Security and Reliability. Therefore, there is no differentiation between the proposed route options and route Option D has been assigned a score of '**Low (Cream)**'.

**Low**

### 7.3.2 Headroom and Ratings Impact

Headroom is the amount of additional capacity each route option offers that would be available for the future without requiring further upgrade. All the proposed route options carry little additional headroom (spare current capacity) due to the nature of the corridor therefore giving no technical differentiation between the proposed routes in this aspect.

The current ratings bottleneck is the impact on the overall circuit ratings of the worst-case deepest obstacle crossing. As all the proposed route options will require some deep crossing solutions (below railways, motorways, rivers or a combination) of similar design, these will be the ratings bottleneck of that particular route. The connection spans north to south, whilst major natural and man-made obstacles are east west orientated, therefore all options cross the river Liffey, the railways, the M4, etc;

On account for the potential total number of Horizontal Directional Drills, Option D (Blue) has been assigned a score of **Low (Cream)**.

Low

### 7.3.3 Maintainability

This considers the ease with which the route option can be serviced and maintained, for example how easy it is to access joint bays and link boxes.

All the proposed route options will be developed with the same design principles. For example, maximum standing sheath voltages, typical trench cross-section, separation between joint bays, location of link boxes (underground in chambers or pillar mounted), same substation entry locations. Whilst some route options come with a greater proportion of off-road build as opposed to road, with the level of design detail available at this stage, is not possible to substantially differentiate between the proposed route options.

As there is no differentiation between the proposed route options and route Option D has been assigned a score of '**Low (Cream)**'.

Low

### 7.3.4 Technology Operational Risk

This criterion aims to capture the risk of operating different technologies on the network.

The same technology is applied to all solutions including cables, joint bays, and bonding. All technology will be the standard technology in the industry and also the dominant technology on EirGrid's existing network (i.e. XLPE insulated underground cables). Therefore, there is no differentiation between the proposed route options and route Option D has been assigned a score of '**Low (Cream)**'.

Low

### 7.3.5 Average Reliability Rates

This is the likelihood of the chosen cable technologies such as cables, joint bays, and bonding failing during operation. All cable technology listed above are common to all route options.

Industry data on Cross-Linked Polyethylene (XLPE) insulation technology indicates that cable failures on a statistical basis are related to cable length.

The proposed route options lengths are as per Table 4.17, Section 4.3.5 (all values are based on desktop surveys).

The small percentage difference between the lengths of the proposed route options does not trigger any substantial increase in the risk of failure. Furthermore, there is not currently sufficient technical detail, at this point, to determine the number increase of joint bays of each route against the shortest (Option C).

Therefore, there is no discernible differentiation between the solutions and route Option D has been assigned a score of '**Low (Cream)**'.

Low

### 7.3.6 Repeatability

Repeatability is whether the proposed technical solution can be readily repeated in the transmission network.

All the proposed route options will be developed with the same design principles; therefore, all route options are easily repeatable across the transmission network. Therefore, there is no differentiation between the proposed route options and route Option D has been assigned a score of '**Low (Cream)**'.

Low

## 7.4 Deliverability

### 7.4.1 Design Complexity

There are 11 surface waterbodies crossed along the length of Option D (Blue), some of which crossed more than once; so there will be 18 crossings in total. These waterbodies will be crossed in a variety of different way in order to minimise the environmental impacts, and to ensure construction and operational efficiency. Option D (Blue) has the second least amount of off-road sections, thus interface with private assets is reduced.

The utilities crossings are assessed in Section 7.2.9 of this report. Option D (Blue) meets the medium-pressure gas network in seven locations with multiple crossings within these sections. The seven locations are at R148 (Kilcock to Maynooth); One the R406 (Maynooth to Straffan road), on the R403 (Clane to Straffan road);on the R407 (Clane to Naas Road), and Millennium Parkway, R445, and R448 (roads within Naas).

Option D (Blue) will require eight major crossings (such as HDD), which is the same number as Option C (Orange) and more than Options A (Red) and B (Green). The two additional crossings are on the River Liffey – a major river and a sensitive receptors these crossings will be of particular complexity.

Option D (Blue) has been assigned a score of **Moderate High (Light Blue)**.

Moderate - High

## 7.4.2 Traffic Disturbance

For Option D (Blue) it is anticipated that full road closures might be required at the following locations:

- L6207 from Ribstown through Cullendragh to Barstown Junction with the R156 an overall distance of 2,460 meters. At this location the carriageway is between 2.5 and 4.0 meters wide and does not allow adequate space for vehicles to pass the construction works safely;
- Moyglare Road Junction (adjacent graveyard) to Moyglare Junction preceding the field crossings, a total distance 1,460 meters the carriageway width is between 4.5 and 6.0 meters. This does not allow adequate room to install a lane closure and carry out the construction works;
- Timard to Laraghbryan West a total distance of 1,170 meters where the carriageway width is between 2.5 and 3.5 meters for the entire duration. The construction works will take the entire width of this carriageway;
- Rathmore Junction to Rathmore a total distance of 850 meters where the carriageway is 3.0 meters wide. The construction works will require the full width of the carriageway;
- At the end of Option A from the Stephenstown South Junction the R412 through to the Dunstown; and
- Substation including turn off, a distance of 1,240 meters. The road is three meters wide so the construction works will take up the width of the road, thereby requiring a full road closure.

There are two road sections along Option D (Blue) where the road width might be reduced to 6.0 meters by the proposed construction works. In these road sections it is anticipated that there might require a lane closure and diversions for the HGV vehicles:

- Mulhussey junction (adjacent to castle in ruins) to Moyglare Road Junction adjacent to graveyard, a total distance of 4,830 meters; and
- R448 Kilcullen Road roundabout at Naas East to the Stephenstown South Junction, a total distance of 5,250 meters.

All the remaining roads on planned Option D (Blue) may require lane closures with appropriate traffic management measures to allow the construction works to be carried out safely, specifically:

- From Barstown Junction with R156 to the Jenkinstown Junction;
- From Jenkinstown Junction to the Mulhussey Junction adjacent to castle;
- From R406 South of the roundabout to R406 Barberstown roundabout;
- From R406 Barberstown roundabout to R406 Capdoo Commons;
- From M7 South crossing to the R409 Ploopluck roundabout; and
- From the R409 Ploopluck roundabout to R448 Kilcullen Road roundabout (Naas East).

The table below provides a high-level summary on the proposed traffic management plans during installation for Option D (Blue). It is recommended that following the selection of the proposed option, a detailed analysis will be carried out with regards to the phasing of the road closures.

**Table 7.14: Summary of Option D (Blue) Traffic Management**

Option D	Total Length (in km)	Lane Closures (in km)	HGV Diversions (in km)	Road Closures (in km)	Field Crossings (in km)
	50.5	25.7 (50.8%)	10.1 (20.0%)	7.2 (14.2%)	9 (18%)

Option D (Blue) requires the lowest number of full road closures compared to the other route options. In terms of traffic disturbance, a Moderate score has been assigned to Option D (Blue) based on the Traffic Management which is anticipated to be required during construction works. Option D (Blue) is also likely to have a lane closure 'with' or 'without' HGV diversions. However, the diversions are likely to be mostly available while at all times maintaining access for the local residents.

It is anticipated though few road sections may require full road closure but there may not be suitable diversions for the through traffic along the length of the route option. Where suitable diversions for through traffic are available along the length of the option, the average installation rate is anticipated to be 80 meters per day, resulting in approximately two years to install this option.

The exact location of the cable trench will be defined later in the project and this will depend on further design, surveys, consultation, and assessment. Consultations with the local authorities will help to define where the cable trench will go in the road to minimise disruption. For example, if a safe alternative could be provided for access with significant disruption for pedestrians, a footpath could be used to minimise disruption to the road network.

Option D (Blue) has the lowest number of road closures and HGV diversions plus the highest number of single lane closures compared to other potential options, thereby having the lowest traffic disruption during construction works. On this basis, in terms of traffic disturbance related to the Traffic Management, Option D (Blue) has been assessed as **Moderate (Dark Green)**.

Moderate

### 7.4.3 Dependence on Other Infrastructure Projects

As outlined in Chapter 1 of this report, all options will have the same dependence on works required at the associated substations in terms of connections. In terms of other infrastructure projects in the area, similar crossing of existing motorways, railways and canals are required. All four of the options will cross the same infrastructure but, in some cases, in different locations. All four options will cross or run parallel with utilities, including water mains and the low to medium pressure gas network - this is further assessed in Section 7.2.9.

All four of the options will cross the proposed Water Supply Project<sup>61</sup> and therefore it is not a differentiator at this point.

Option B (Green), Option C (Orange), and Option D (Blue) will cross the proposed DART+ West railway line<sup>62</sup> at the crossing point of the Dublin Sligo railway line. This project proposes the electrification and re-signalling of the Maynooth line and construction of a new DART depot facility west of Maynooth for the maintenance and parking of trains. West of Maynooth, the rail track will be upgraded to a twin-track between Maynooth and the proposed depot. This twin track configuration will divert offline to the south, running parallel to the existing railway on the approach to the proposed depot. The planning application is expected to be made to An Bord Pleanála in 2022, with construction possible in 2025. At this location, it is proposed that Options B (Green), Option C (Orange), and Option D (Blue) will cross the existing railway line by HDD. The proposed DART+ West project will require a long crossing and additional studies and shielding to ensure that there are no electro-magnetic forces issues between the Kildare-Meath Grid Upgrade project and the electrified line. At this stage, it is not considered that there would be any conflicts between the two projects and both could be constructed without significant constraint. It is possible that both projects would be at construction at the same time and additional consideration would be

<sup>61</sup> <http://www.watersupplyproject.ie/>

<sup>62</sup> <https://www.dartplus.ie/en-ie/projects/dart-west>



needed to the cumulative effects, if Options B (Green), Option C (Orange), and Option D (Blue) were selected as the Emerging Best Performing Option.

The M4 Maynooth to Leixlip project<sup>63</sup> is listed as a section of the transport network to be progressed through pre-appraisal and early planning. The proposed 10km project involves the M4 mainline carriageway from Maynooth to Leixlip and the associated mainline junctions, Maynooth train line, the surrounding road network and any existing and proposed alternative transport modes or routes that provide suitable alternatives in favour of the M4/N4. The widening of the M4 could take place to the north of the existing M4 route, where Option D runs parallel to the motorway to the south of Maynooth. If Option D (Blue) were selected as the Emerging Best performing Option, additional consideration would need to be given to ensure there are no conflicts to either project.

Option D is **Moderate-High (Light Blue)** in terms of dependence on other infrastructure projects.

Moderate-High

#### 7.4.4 Permits and Wayleaves

At this stage of the assessment all route options will have a similar issue with permits. However, Options D (Blue) will have similar amounts of off-road sections and similar requirements for wayleaves as Option A (Red). As such, Option D (Blue) has been assessed as **Low-Moderate (Light Green)**.

Low-Moderate

#### 7.4.5 Implementation Timelines

This route option has the highest amount of live lane working / lane closures and the second lowest of field crossings. Therefore, Option D (Blue) has been assigned a score of **Moderate (Dark Green)**.

Moderate

#### 7.4.6 Combined Deliverability Performance

Considering the design complexity, traffic disturbance, impact dependence and implementation timelines, a rating of **Moderate (Dark Green)** has been assigned. Option D (Blue) has scored more highly in terms of design complexity because of additional major crossings (HDD) and additional crossings of the River Liffey. It has also scored highly in terms of impact on other infrastructure projects as it crossed the area of the DART+ West project and the M4 widening.

Moderate

<sup>63</sup> <https://maynoothleixlip.ie/>



## 7.5 Economic

As set out in Section 2.3.4, the topic areas under consideration to assist with determining the best route option are as follows:

- Length of installed cable;
- Quantity of Minor and Major service crossings; and
- Number of Major Crossings (such as Horizontal Directional Drills.)

### 7.5.1 Length of Installed Cable

The first economic assessment is from the overall lengths of the cable routes (presented in Table 4.17, Section 4.3.5). From this, Option D (Blue) has a total length of 50.5 km which is 8% longer than the shortest route (Option C (Orange)) and therefore it can be assumed to have 8% more of an economic impact in this aspect.

For this reason, Option D (Blue) has been assigned a score of **Moderate (Dark Green)**.

**Moderate**

### 7.5.2 Quantity of Crossings

An assessment of both the minor and major crossings expected to be encountered for the cable route options has been carried out by categorising them into the different crossing types (presented in Section 2.3.3.2). Summaries of these are listed below where Type 1 has the lowest impact and Type 4 has the highest.

- Type 1 Crossings - shallow crossings (utility/drainage/other) - deeper installation;
- Type 2 Crossings - shallow water crossings (Open cut solution);
- Type 3 Crossings - larger water crossings (Cable bridges/culverts/micro tunnels); and
- Type 4 Crossings - large crossings (Horizontal directional drills/ Auger bores or tunnel solutions).

It has been found that route Option D (Blue) has the Joint most Type 1, least amount of Type 2, most amount of Type 3, and joint most Type 4 crossings. For this reason, Option D (Blue) has been assigned a score of **Moderate-High (Light Blue)**.

**Moderate-High**

## 7.6 Summary of Option D (Blue) Assessment

### 7.6.1 Environment Summary

Option D (Blue) has been scored as **Moderate (Dark Green)** overall. This is due to crossing with zonings within the Clane and Draft Naas LAPs, a longer section within the River Liffey 'Principal Landscape Sensitivity Factor', Areas of potential geological deposits including a Mine within 200m of the route option, increased watercourse crossings, and increased cultural heritage effects (including Jigginstown Castle). A summary of the environmental appraisal of Option D (Blue) is provided in Table 7.15.

**Table 7.15: Summary of Environment Assessment for Option D (Blue)**

Biodiversity	Soils and Water	Planning Policy and Land Use	Landscape	Archaeology, Architectural Heritage, and Cultural Heritage	Combined Environment Score
Moderate-High	Moderate	Moderate	Low-Moderate	Moderate	Moderate

### 7.6.2 Socio-Economic Summary

Option D (Blue) passes the greater number of properties than the other options; has a greater visual impact at Alexandra Bridge; passes along the R403 and R406 which are densely populated and importance routes for local and regional traffic. It has been assigned a **Moderate – High (Light Blue)** score. A summary of the socio-economic appraisal of Option D (Blue) is provided in Table 7.16.

**Table 7.16: Summary of Socio-economic Assessment for Option D (Blue)**

Traffic and Transport	Noise and Vibration	Air Quality	Visual	Amenity	Health	Employment and Economy (and Tourism)	Land Use (and Land-take)	Agriculture (including Equine)	Utilities	Combined Socio-economic Score
Moderate-High	Moderate	Moderate	Low-Moderate	Moderate-High	Low-Moderate	Low	Low	Low-Moderate	Low-Moderate	Moderate-High

### 7.6.3 Technical Summary

At this stage in the Proposed Project are there no technical differentiations apart from the number of major crossings. Options A (Red) and B (Green) will have two fewer than Options C (Orange) and D (Blue). Other technical factors will have no impact on the selection of the best performing option. Option D (Blue) has been assessed to have a **Low-Moderate (Light Green)** score for the technical criterion.

**Table 7.17: Summary of Technical Assessment for Option D (Blue)**

General Compliance	Headroom	Maintainability	Technology Operational Risk	Average Reliability Rates	Repeatability	Combined Technical Score
Low	Low	Low	Low	Low	Low	Low

## 7.6.4 Deliverability Summary

Considering the design complexity, traffic disturbance, impact dependence and implementation timelines, a rating of **Moderate (Dark Green)** has been assigned. Option D (Blue) has scored more highly in terms of design complexity because of additional major crossings (HDD) and additional crossings of the River Liffey. It has also scored highly in terms of impact on other infrastructure projects as it crossed the area of the DART+ West project and the M4 widening. It has scored Moderate and Low-Moderate in the other topics and so an overall score of Moderate has been assigned.

**Table 7.18: Summary of Deliverability Assessment of Option D (Blue)**

Design complexity	Traffic disturbance	Dependence on other infrastructure projects	Permits and wayleaves	Implementation Timelines	Combined Deliverability Score
Moderate -High	Moderate	Moderate -High	Low- Moderate	Moderate	Moderate

## 7.6.5 Economic Summary

At this stage in the Proposed Project, the only differentiations between route options are cable route lengths and the impact from the quantity of expected major crossings. Option D (Blue) has been assessed to have a **Moderate-High (Light Blue)** score for the economic criterion due to the high number of major crossings (such as HDDs) and longer route length when compared to the shortest Option C (Orange).

**Table 7.19: Summary of Economic Assessment of Option D (Blue)**

Length of Installed Cable	Quantity of Crossings	Combined Economic Score
Moderate	Moderate-High	Moderate-High

## 8. Emerging Best Performing Option and Conclusion

Table 8.1 summarises the findings of the assessment of the four options.

### 8.1 Environment Assessment

Table A1.2 below summarises the findings of the environmental assessment for each of the solution options. For more detail on how each individual option was appraised, please see Section 4.1, 5.1, 6.1 and 7.1, respectively.

**Table 8.1: Summary of Environmental Assessment for Options**

Option	Biodiversity	Soils and Water	Planning Policy and Land Use	Landscape and Visual	Archaeology, Architectural Heritage, and Cultural Heritage	Combined Environment Score
Option A (Red)	Moderate-High	Moderate	Moderate	Low-Moderate	Moderate-High	Moderate
Option B (Green)	Moderate-High	Low-Moderate	Low	Low-Moderate	Moderate	Low-Moderate
Option C (Orange)	Moderate-High	Low-Moderate	Low-Moderate	Low-Moderate	Low-Moderate	Low-Moderate
Option D (Blue)	Moderate-High	Moderate	Moderate	Low-Moderate	Moderate	Moderate

Overall, Option A (Red) has been scored as **Dark Green (Moderate)** in terms of risk of environmental impact. This is due to crossings within the zoned land, increased watercourse crossings, and increased cultural heritage effects (mitigation measures to reduce the effects will be considered at the next step). This route option is in proximity to the highest number Recorded Monuments (including Jigginstown Castle), Protected Structures, and Gardens and Designed Landscapes. Option B (Green) has been scored as **Low-moderate (Light Green)** overall. This Option interacts with less zoned land than Option A (Red) as it avoids Kilcock. Option C (Orange) has been scored as **Low-moderate (Light Green)** overall. Option C (Orange) scores higher in terms of Land Use Planning due to impacts to a solar farm application. Option D (Blue) has been scored as **Moderate (Dark Green)** overall. This is due to crossing with zonings within the Clane and Draft Naas Local Area Plans, a longer section within the River Liffey 'Principal Landscape Sensitivity Factor'.

## 8.2 Socio-economic Assessment

Outlined below are the findings of the socio-economic assessment of each of the solution options. For more information on these findings, please see Section 4.2, 5.2, 6.2 and 7.2 respectively.

**Table 8.2: Summary of Socio-economic Assessment of Options**

Option	Traffic and Transport	Noise and Vibration	Air Quality	Visual	Amenity	Health	Employment and Economy (and Tourism)	Land Use (and Land-take)	Agriculture (including Equine)	Utilities	Combined Socio-economic Score
Option A (Red)	Moderate - High	Moderate	Moderate	Low-Moderate	Low-Moderate	Low-Moderate	Low	Low	Low	Low-Moderate	Low-Moderate
Option B (Green)	Moderate - High	Low-Moderate	Low-Moderate	Low-Moderate	Moderate	Low	Low	Low	Low-Moderate	Low-Moderate	Moderate
Option C (Orange)	Moderate - High	Low-Moderate	Low	Low-Moderate	Low-Moderate	Low	Low	Low	Moderate	Low-Moderate	Moderate
Option D (Blue)	Moderate - High	Moderate	Moderate	Low-Moderate	Moderate-High	Low-Moderate	Low	Low	Low-Moderate	Low-Moderate	Moderate-High

Option A (Red) will pass less properties than Option D (Blue) and require less full road closures during construction compared to Options B and C. However because more of its length is in regional roads, traffic disturbance will be comparatively greater due to the increased traffic on those roads. While the traffic impacts will be temporary and restricted to the construction phase, in order to minimise the disturbance, traffic surveys will be undertaken to confirm this assumption. Mitigation measures to reduce the effects will be considered at the next step. Consultation will be undertaken with Meath and Kildare County Councils to agree the approach to traffic management and avoid and/or reduce the impacts. Option A (Red) has the least significant agricultural land issues as it crosses the least amount of agricultural/private land. Option B (Green) travels through the settlement of Rathcoffey, which will result in disruption to this settlement during the construction phase. Option C (Orange) is considered to have a similar combined social impact to Option A (Red) and Option B (Green), however individual social impacts are more similar to Option B (Green) than Option A (Red). As such, it has been assigned a **Moderate (Dark Green)** score. Option D (Blue) passes the greater number of properties than the other options; has a greater visual impact at Alexandra Bridge; passes along the R403 and R406 which are densely populated and important routes for local and regional traffic. It has been assigned a **Moderate – High (Light Blue)** score.

## 8.3 Technical Assessment

At this stage in the Proposed Project there no technical differentiations apart from the number of major crossings. Options A (Red) and B (Green) has two fewer than Options C (Orange) and D (Blue). Other technical factors will have no impact on the selection of the Best Performing Option. Outlined below are the findings of the technical appraisal of each of the options. For more information on these findings, see Section 4.3, 5.3, 6.3, and 7.3.

**Table 8.3: Summary of Technical Assessment of Options**

Option	General Compliance	Headroom	Maintainability	Technology Operational Risk	Average Reliability Rates	Repeatability	Combined Technical Score
Option A (Red)	Low	Low	Low	Low	Low	Low	Low
Option B (Green)	Low	Low	Low	Low	Low	Low	Low
Option C (Orange)	Low	Low	Low	Low	Low	Low	Low
Option D (Blue)	Low	Low	Low	Low	Low	Low	Low

At this stage in the Proposed Project, are there no technical differentiations apart from the number of major crossings. All four of the options are technically sound and could be constructed in-line with EirGrid's technical standards. Options A (Red) and B (Green) will have two fewer than Options C (Orange) and D (Blue). However this may not present a technical issue in terms of the rating of the cable. Other technical factors will have no impact on the selection of the best performing option. Each of the four options have been assessed to have a **Low (Cream)** score for the technical criterion. This demonstrates that only technically sound options have been taken forward for assessment. Further assessment of the Emerging Best Performing Option in terms of the technical criterion will be undertaken through the next steps of the Proposed Project.

## 8.4 Deliverability Assessment

Outlined below are the findings of the deliverability assessment of each of the solution options. For more information on these findings, please see Section 4.4, 5.4, 6, and 7.4 respectively.

**Table 8.4: Summary of Deliverability Assessment of Options**

Solution Option	Design complexity	Traffic disturbance	Dependence on other infrastructure projects	Permits and wayleaves	Implementation Timelines	Combined Deliverability Score
Option A (Red)	Low-Moderate	Moderate-High	Low-Moderate	Low-Moderate	Low-Moderate	Low-Moderate
Option B (Green)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Option C (Orange)	High	Moderate-High	Moderate	Moderate-High	Moderate-High	High
Option D (Blue)	Moderate - High	Moderate	Moderate -High	Low- Moderate	Moderate	Moderate

Option A (Red) has more favourable Deliverability scores compared to the other options. Option A (Red) generally performed better in four of the Deliverability topics compared to the other options – Design Complexity; Dependence on Other Projects; Permits and Wayleaves; and Implementation Timelines. Option A (Red) has the least amount of off-road sections and so this will reduce the number of landowners directly affected and reduce the amount of wayleaves required. Option A (Red) did score more highly or equal for Traffic Disturbance because it has the most amount road sections and impacts more regional roads than the other options, which will increase traffic disturbance. While the traffic impacts will be temporary and restricted to the construction phase, in order to minimise the disturbance, traffic surveys will be undertaken to confirm this assumption. Other survey and design work will be completed to confirm the assumptions made on the required working area. In addition, localised route changes could be designed and assessed to minimise impacts further. Consultation will be undertaken with Meath and Kildare County Councils to agree the approach to traffic management and avoid and/or reduce the impacts.

## 8.5 Economic Assessment

At this stage in the Project, the only differentiations between route options are route lengths and the impact from the quantity of expected major crossings. Table 8.5 outlines the findings of the economic appraisal of each of the solution options. For more information on these findings, please see Section 4.5, 5.5, 6.5, and 7.5 respectively.

**Table 8.5: Summary of Economic Assessment of Options**

Route Option	Length of Installed Cable	Quantity of Crossings	Combined Economic Score
Option A (Red)	Moderate	Low	Low-Moderate
Option B (Green)	Moderate	Low	Low-Moderate
Option C (Orange)	Low	Moderate-High	Low-Moderate
Option D (Blue)	Moderate	Moderate-High	Moderate-High



At this stage in the Proposed Project, the only differentiations between route options are cable route lengths and the impact from the quantity of expected major crossings. Option A (Red) has been assessed to have a **Moderate (Dark Green)** score for the economic criterion due to the fewer HDDs balancing out the longer length of the route when compared to the shortest Option C (Orange).

## 8.6 Overall Summary

**Table 8.6: Summary of Options Assessment**

Option	Environment Score	Socio-economic Score	Technical Score	Deliverability Score	Economic Score
Option A (Red)	Moderate	Low-Moderate	Low	Low-Moderate	Low-Moderate
Option B (Green)	Low-Moderate	Moderate	Low	Moderate	Low-Moderate
Option C (Orange)	Low-Moderate	Moderate	Low	High	Low-Moderate
Option D (Blue)	Moderate	Moderate-High	Low	Moderate	Moderate-High

It was determined that Option A (Red) would be selected as the Emerging Best Performing Option. This is due to several factors including its better Socio-Economic and Deliverability scores compared to the other options. These lower Socio-economic impacts means that there will be less impacts to communities. While it is the longest of the four options, it passes fewer properties compared to Option D (Blue) and it has fewer major crossings (such as HDD) compared to Options C and D. It also impacts the least amount of agricultural land of the four options. Additionally, by crossing less agricultural land, there are likely to be fewer impacts to hedgerows and treelines, and therefore reduced ecological and landscape effects. While Option A (Red) has increased cultural heritage and traffic impacts compared to the other options, further survey, consultation, design, and assessment work will be undertaken to reduce and/or avoid the impacts.

Option A (Red) also has more favourable Deliverability scores compared to the other options. Option A (Red) generally performed better in four of the Deliverability topics compared to the other options – Design Complexity; Dependence on Other Projects; Permits and Wayleaves; and Implementation Timelines.

Option B (Green) was not selected because of the socio-economic impacts from travelling through Rathcoffey. It was also found to have scored less-well in Deliverability: including design complexity, other projects (e.g. impacting the proposed area of the Dart+ West project), permits and wayleaves, and implementation timelines.

Option C (Orange) was not selected as it required two additional major crossings of the River Liffey compared to Option A (Red). It also affects much more agricultural land, and scores poorly in terms of Deliverability – more road closures and impacting the proposed area of the Dart+ West project

Option D (Blue) was not selected as it also has two additional major crossings of the River Liffey, and impacts the R403 and R406 significantly, meaning it travels past more roadside properties, it also has significant impact to the east of Clane, and scores less well on Impact Dependence on other Infrastructure (e.g. impacting the proposed area of the Dart+ West project) and Design Complexity.

The next Step for the Proposed Project is Step 4B, which is about routing the cable in more detail following further survey, consultation, design, and assessment work. This will provide an opportunity to seek to further reduce and potentially avoid some of the impacts in this option and to consult on mitigation measures. These can then be designed into this option. Step 4B will seek to reduce the archaeological, architectural heritage, and cultural

heritage effects, which assessed to be greater at this point on the project for Option A (Red) compared to the other options. This is largely due to passing more Gardens and Designed Landscapes than the other options.

Option A (Red) will pass less properties than Option D (Blue) and require less full road closures compared to Options B and C; however because more of its length is in regional roads, construction traffic disturbance will be comparatively greater due to the increased traffic using those roads. While the traffic impacts will be temporary and restricted to the construction phase, in order to minimise the disturbance, traffic surveys will be undertaken to confirm this assumption. Other survey and design work will be completed to confirm the assumptions made on the required working area. In addition, localised route changes could be designed and assessed to minimise impacts further. While Option A (Red) will have negative effects as any large infrastructure project would have, it has been determined to be the best overall option for the Proposed Project. All of the options will have some degree of impact and it has been determined that Option A (Red)'s impacts are less or could be reduced with further design and assessment. Mitigation measures that will be applied include Construction Environmental Management Plans, Traffic Management Plans, reinstatement of agricultural land, archaeological investigations, ecological and landscape planting, habitat enhancements, and consultation with affected landowners, people living in the area affected, and with statutory bodies to identify the best way to construct the Proposed Project.

In conclusion, Option A (Red) was selected as the Emerging Best Performing Option because of less Socio-Economic and Deliverability impacts, fewer major crossings (such as HDD), and it impacts the least amount of agricultural land. Impacts in terms of construction traffic and cultural heritage can be reduced at the next step in the project through further design, surveys, consultations, and assessment. This will provide an opportunity to seek to further reduce and potentially avoid some of the impacts in this option and to consult on mitigation measures. These can then be designed into this option.

## 8.7 Consultation Feedback on Option A (Red)

In terms of Option A (Red), many respondents expressed their support for this option, stating that in general terms Option A (Red) was the 'best option' or a 'reasonable' option. A few respondents stated that Option A (Red) represented the most direct route by following existing roads and many respondents highlighted that Option A (Red) would have less of an impact on the surrounding area than the other proposed options. Some of these respondents stated that Option A (Red) would be less disruptive to local communities, arguing that less landowners would be affected and that the option would not contribute to traffic in areas that are already experiencing congestion, such as Sallins, Clane and Kilcock. Many respondents outlined that the additional length of Option A (Red) compared to other options was acceptable, as this option would not impact on high-output soils, and would therefore have the least impact on agricultural land. These respondents stated that agriculture is an important sector in this area. In addition, a small number of respondents stated that Option A (Red) would have less of an environmental impact than the other options given the fact that there is a lower estimated figure for off-road sections.

A few respondents, however, were generally opposed to this option, with these respondents stating that Option A (Red) is too long or makes use of a circuitous route, and would result in significant environmental impacts, as well as affecting agricultural land. Several respondents expressed concerns about Option A (Red), such as impacts on traffic, as the area already experiences high volumes of traffic, including Heavy Goods Vehicles. Respondents specifically mentioned the R407 Regional Road which was recently subjected to works over a lengthy period of time and the L2002 Local Road which is used as a bypass for Clane. A small number of respondents raised concerns about potential impacts on local communities, with some referring to the possibility of dust and noise impacts or restrictions to movements due to project works. Concerns were also raised about potential damage that could occur to the heritage buildings or sewerage infrastructure in Prosperous. In addition, a few respondents outlined that other recent or current development projects have already impacted on their homes in the vicinity, while a

similar number raised concern about the potential disruption to the operation of Larchill Arcadian Gardens due to works on the R125 Regional Road.

A few respondents offered suggestions for Option A (Red), including suggestions to:

- Avoid Kilcock;
- Route the cables along roads;
- Ensure that access in both directions along the R125 Regional Road is maintained during construction through the use of a traffic light management system; and
- Amend the route between Prosperous and Sallins to pass through Millicent and Digby Bridge, then along the canal walkway, restoring the path afterwards to an improved standard.

**Table 8.7: Option A (Red) Consultation Feedback and How Feedback Has Been Considered / Addressed**

Consultation Feedback Topic	How Feedback Has Been Considered / Addressed
Traffic Impacts	The potential for traffic related impacts associated with Option A (Red) have been considered in Section 4.2.1 of this Report. For Option A (Red), full lane or a road closure during the construction works 'with' or 'without' Heavy Goods Vehicles, diversions are mostly available while at all times maintaining access for local residents. Public consultation feedback in relation to traffic will be considered further in the next Step of the Proposed Project.
People and Communities (including Kilcock)	Potential impacts on people and communities associated with Option A (Red) have been considered in the socio-economic assessment in Section 4.2. Concerns raised in relation to people and communities during public consultation will be considered further in the next phase of the Proposed Project and appropriate mitigation measures will be outlined to minimise any potential impacts.
Route	The route for Option A (Red) has been assessed in detail in this Report under a number of key criteria including environment, socio-economic, technical, deliverability and economic topics (refer to Section 4). Route Option A (Red) scored better in terms of socio-economic and technical assessment criteria compared to the other options, while it is the longest of the proposed options. Consultation feedback in relation to the route will also be considered further during the next phase of the Proposed Project.
Environment	The potential environmental impacts of Option A (Red) have been considered in Section 4.1. Environmental concerns raised during public consultation will be considered further in the next phase of the Project and appropriate mitigation measures will be outlined to minimise potential impacts.
Agricultural Land	Option A (Red) will impact the least amount of agricultural land of all of the proposed options. Agricultural land take required for Option A (Red) has been assessed as part of Section 4.2.8 of this Report and best practice measures will be applied to minimise any impacts on agricultural land. Consultation feedback in relation to agricultural land will also be considered further during the next phase of the Proposed Project.
Cost	Costs associated with route sections for Option A (Red) have been considered in Section 4.5 of this Report. Consultation feedback in relation to costs will be considered further in the next phases of the Proposed Project, when more specific project details are available.
Heritage buildings or sewerage infrastructure in Prosperous	Option A (Red) will not pass through Prosperous. Water mains and sewerage infrastructure will be a key consideration in the next steps of the Proposed Project.
Cumulative Impacts from recent or current development projects	These suggestions will be addressed in Step 4B of the Proposed Project.
Larchill Arcadian Gardens	Larchill Arcadian Gardens is assessed in Chapter 4 of this report. During construction, access to tourist and community facilities such as Larchill will be maintained to minimise any impacts.
Amend the route between Prosperous and Sallins to pass	These suggestions will be examined in Step 4B of the Proposed Project.

Consultation Feedback Topic	How Feedback Has Been Considered / Addressed
through Millicent and Digby Bridge	

## 8.8 Next Steps

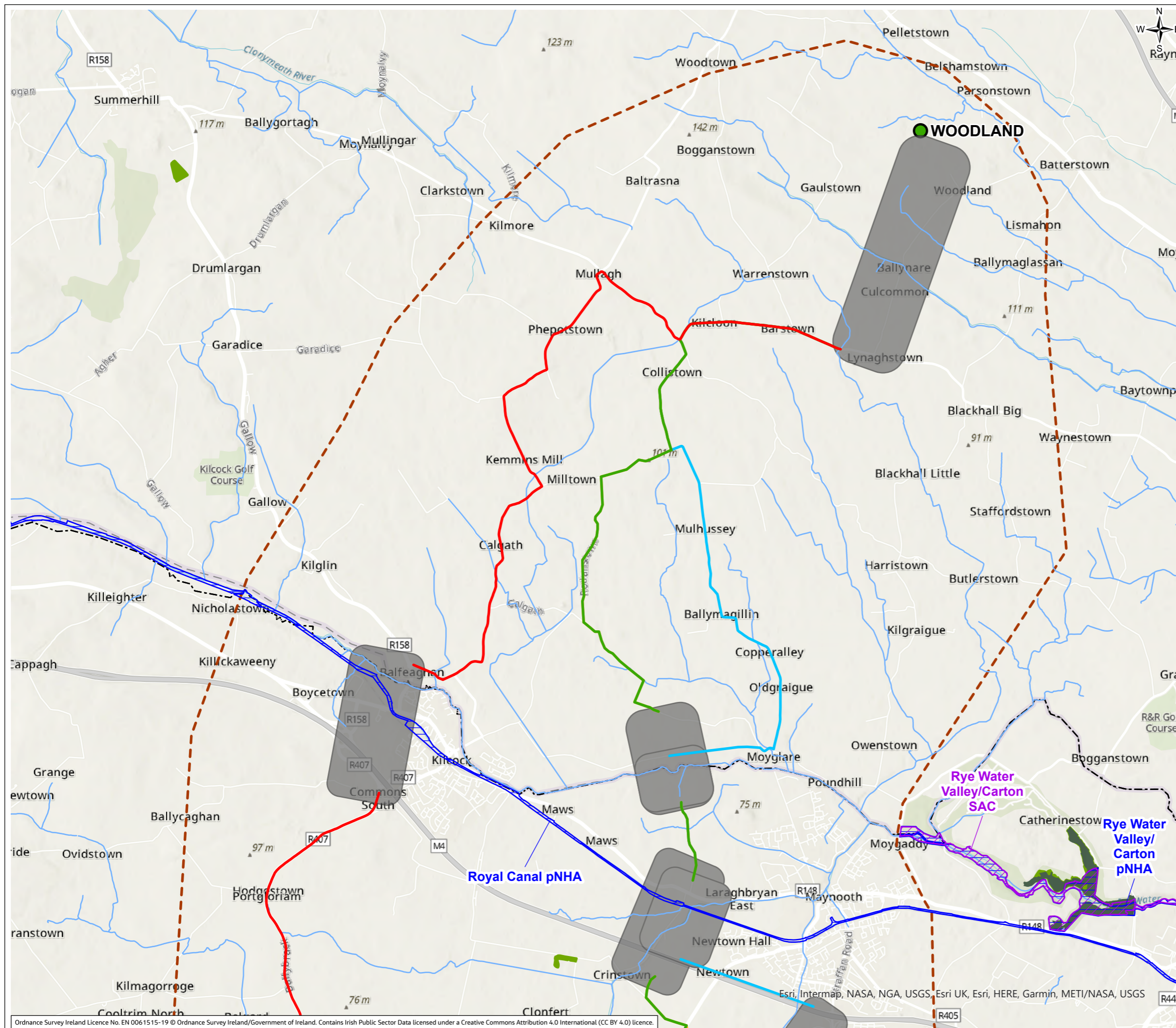
The following actions will be completed on the Proposed Project:

- This Step 4A report will be published and any feedback will be considered by the project team and amendments will be made where it is considered appropriate;
- EirGrid will meet with affected landowners (subject to Covid protocols) to discuss the Proposed Project to seek agreement on the way forward. Further meetings will also be held with bodies such as Meath and Kildare County Councils, TII, Irish Rail, Waterways Ireland, and the utility providers such as Irish Water and Gas Networks Ireland;
- The project team will undertake a wide range of surveys to help to refine the design and location of the proposed cable. This will also include designing how the cable will be constructed and how traffic disturbance will be minimised through traffic management. The surveys include archaeology, ecology, agriculture, ground investigations, utilities surveys, hydrology, technical assessments, etc. These surveys will likely result in changes to the route shown in this report. This is a normal part of the design process – as further information is gathered, new issues can be identified resulting in changes to the route. The changes are likely to be minor in nature and will not affect the conclusion that Option A (Red) is the Emerging Best Performing Option. If large scale changes are required, then the assessment will be remade, and further consultation will be undertaken;
- Further design work will be progressed at the substations to determine the works required to connect the proposed cable into the grid;
- When the proposed cable route and design have been progressed further, a further report called the Step 4B report will be published for public consultation. This will allow further comments on the proposed route which will be addressed by the project team. The Step 4B report is likely to be published in the middle of 2022; and
- Following that, the project team will prepare the planning submission for the Proposed Project. Further updates will be published by EirGrid on the project website:  
[www.eirgridgroup.com/the-grid/projects/capital-project-966/the-project/](http://www.eirgridgroup.com/the-grid/projects/capital-project-966/the-project/)

## **Appendix A. 1 – Biodiversity (Flora and Fauna) Figures**



**FIGURE A.1.1**



- Legend**
- Study Area
  - County Boundary
  - 400kV Substation
  - Proposed Cable Route - Option A (Red)
  - Proposed Cable Route - Option B (Green)
  - Proposed Cable Route - Option C (Orange)
  - Proposed Cable Route - Option D (Blue)
  - Off-Road Options Being Explored
  - Special Area of Conservation (SAC)
  - Proposed Natural Heritage Area (pNHA)
  - Ancient & Long-Established Woodland
  - Native Woodland
  - Watercourse (EPA Data)



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Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

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Client

**EIRGRID**

Project

EirGrid Kildare-Meath Grid Upgrade

Drawing Title

Ecological Constraints (All Options)  
Sheet 1 of 3

Drawing Status

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Client No.

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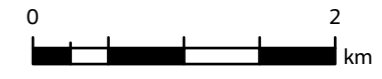
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**FIGURE A.1.1**

**Legend**

- Study Area
- County Boundary
- 400kV Substation
- Proposed Cable Route - Option A (Red)
- Proposed Cable Route - Option B (Green)
- Proposed Cable Route - Option C (Orange)
- Proposed Cable Route - Option D (Blue)
- Off-Road Options Being Explored
- Special Area of Conservation (SAC)
- Proposed Natural Heritage Area (pNHA)
- Ancient & Long-Established Woodland
- Native Woodland
- Semi-Natural Grassland Revele
- Semi-Natural Grassland Habitat
- Margaritifera Sensitive Areas
- Catchments with previous records of Margaritifera, but current status unknown
- Watercourse (EPA Data)



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Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

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Project  
EirGrid Kildare-Meath Grid Upgrade

Drawing Title  
Ecological Constraints (All Options)  
Sheet 2 of 3

Drawing Status  
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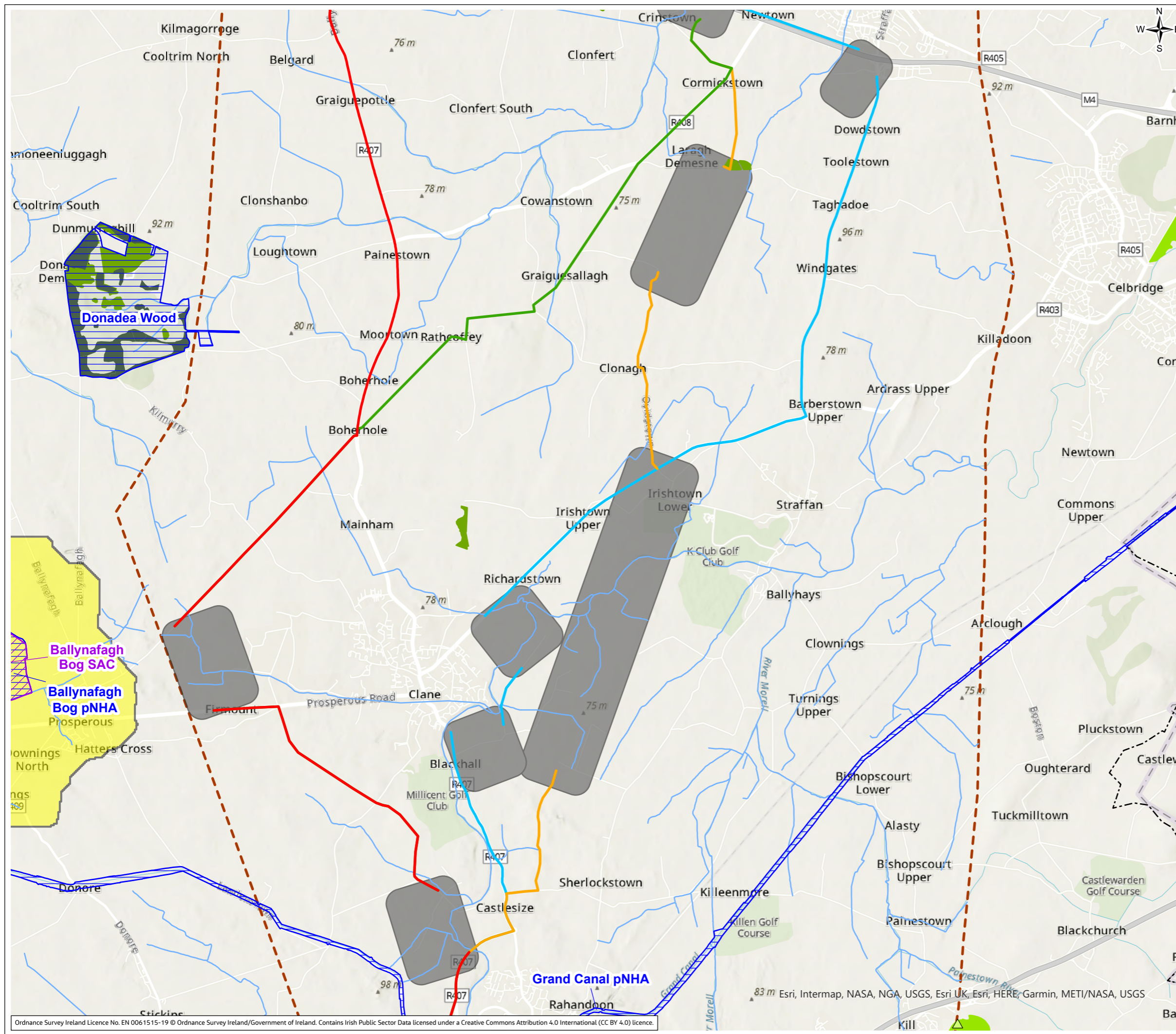
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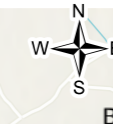




**FIGURE A.1.1**

**Legend**

- Study Area
- County Boundary
- 400kV Substation
- Proposed Cable Route - Option A (Red)
- Proposed Cable Route - Option B (Green)
- Proposed Cable Route - Option C (Orange)
- Proposed Cable Route - Option D (Blue)
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- Semi-Natural Grassland Habitat
- Watercourse (EPA Data)



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Project

EirGrid Kildare-Meath Grid Upgrade

Drawing Title

Ecological Constraints (All Options)  
Sheet 3 of 3

Drawing Status

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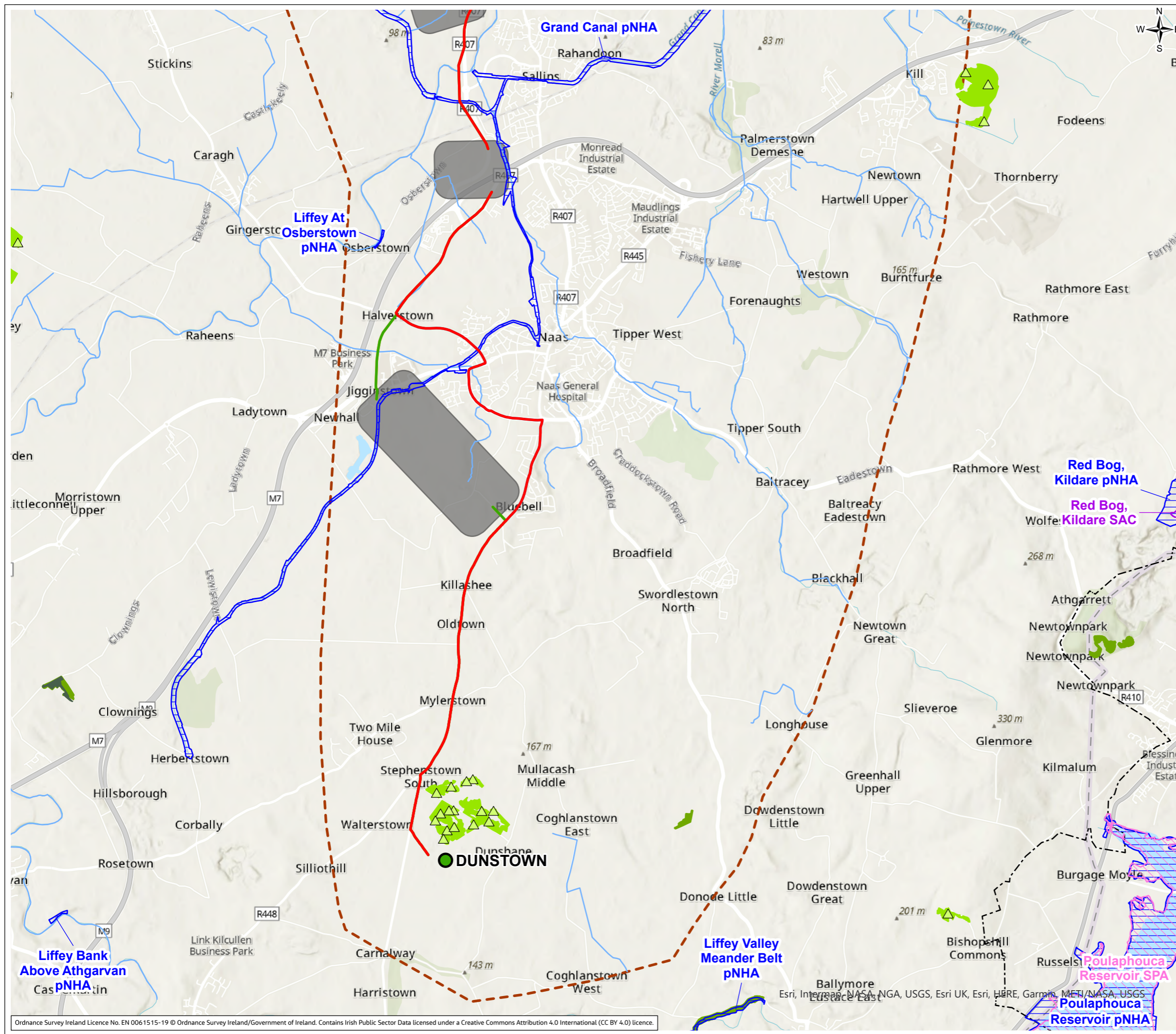
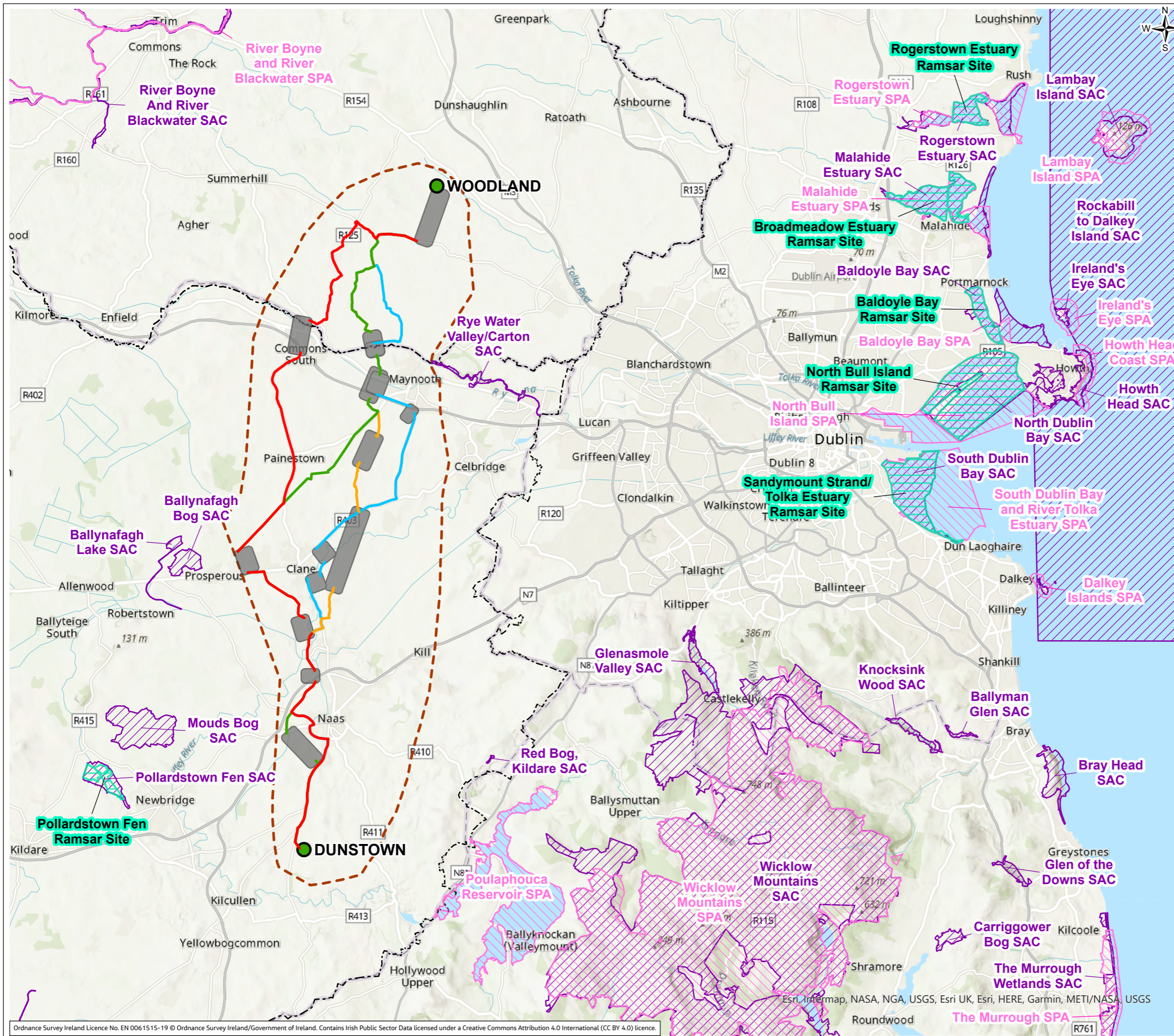


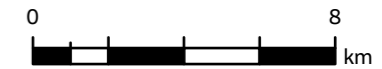


FIGURE A.1.2



**Legend**

- Proposed Cable Route - Option A (Red)
- Proposed Cable Route - Option B (Green)
- Proposed Cable Route - Option C (Orange)
- Proposed Cable Route - Option D (Blue)
- Off-Road Options Being Explored
- Ramsar Site
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- 400kV Substation
- County Boundary
- Study Area



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## **Appendix B. 1** – Archaeology, Architectural Heritage and Cultural Heritage



## **Kildare-Meath Grid Upgrade**

**Step 4A Report – Appendix B.1**

**Archaeology, Architectural Heritage, and Cultural Heritage Baseline Information**

**KMGU-JAC-TN-0017**

**February 2022**

**EirGrid**



## Kildare-Meath Grid Upgrade

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### Annex A. Inventory of Archaeology, Architectural Heritage and Cultural Heritage Constraints

## 1. Introduction

This appendix presents the baseline information gathered for the archaeology, architectural heritage and cultural heritage constraints identified within 100m of each of the four route options (Option A (Red), Option B (Green), Option C (Orange), and Option D (Blue)) identified for the Kildare–Meath Grid Upgrade project (the ‘Proposed Project’). The purpose of the appendix is to support the archaeology, architectural heritage and cultural heritage input into the Step 4A Report - Analysis of the Route Options for the Proposed Project. Figures showing the locations of the archaeology, architectural heritage and cultural heritage constraints are presented in Appendix B.1.

In line with the guidance provided by *Cultural Heritage Guidelines for Electricity Transmission Projects* (EirGrid, 2015), cultural heritage has been assessed under the following topics:

- Archaeology - defined as *‘the study of past societies through the material remains left by those societies and the evidence of their environment. The ‘archaeological heritage’ consists of such material remains (whether in the form of sites and monuments or artefacts in the sense of moveable objects) and environmental evidence’* (EirGrid, 2015, page 5).
- Architectural Heritage - comprising *‘all structures and buildings (together with their settings and attendant grounds, fixtures and fittings, groups of such structures and buildings and sites), which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. Architectural heritage is generally visible and has a presence in the landscape which requires assessment’* (EirGrid, 2015, page 6).
- Cultural Heritage - defined as *‘a general term used to describe aspects of the environment and intangible heritage which are valued for their age, beauty, history or tradition. It encompasses aspects of archaeology, architecture, history, landscape and garden design, folklore and tradition and topography. Cultural heritage is expressed in the physical landscape in numerous often interrelated ways’* (EirGrid, 2015, page 6).

Section 2 of this appendix provides the methodology, including the legislative background and sources of information, used to identify archaeology, architectural heritage and cultural heritage constraints within 100m of each of the four route options identified for the Proposed Project. Section 3 describes the archaeology, architectural heritage and cultural heritage constraints within 100m of each of the four route options.<sup>1</sup> An Inventory of Archaeology, Architectural Heritage and Cultural Heritage Constraints is also provided (Annex A).

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<sup>1</sup> Please note a summary of archaeology, architectural heritage, and cultural heritage constraints identified within the Step 3 Project Study Area along with a discussion on the general character and nature of the constraints present is presented in the Step 4A Environmental Constraints Report and has not been duplicated here. The Step 4A Environmental Constraints Report is available at: <https://consult.eirgrid.ie/system/files/materials/2055/Environmental%20Constraints%20Report%20-%20Step%204A%20-%20KMGU.pdf>.



## 2. Methodology

### 2.1 Legislation and Guidance

This appendix was informed by the following legislation and best practice guidance:

- National Monuments Act 1930 to 2014;
- European Cultural Convention 1954;
- International Council on Monuments and Sites (ICOMOS) International Charter for the Conservation and Restoration of Monuments and Sites 1964;
- United Nations Educational, Scientific and Cultural Organisation (UNESCO) Convention Concerning the Protection of the World Cultural and Natural Heritage 1972;
- Convention for the Protection of the Architectural Heritage of Europe (Granada, 1985);
- Convention for the Protection of the Archaeological Heritage of Europe (revised) (Valletta, 1992);
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999;
- Framework and Principles for the Protection of the Archaeological Heritage (Department of Arts, Heritage, Gaeltacht and Islands (now Department of Culture, Heritage and Gaeltacht), 1999);
- Planning and Development Act 2000 to 2020;
- Convention on the Value of Cultural Heritage for Society (Faro Convention, 2005);
- Code of Practice between the Department of the Environment, Heritage and Local Government and EirGrid (Department of the Environment, Heritage and Local Government and EirGrid, 2009);
- Architectural Heritage Protection Guidelines for Planning Authorities (Department of Arts Heritage and the Gaeltacht, 2011); and
- Cultural Heritage Guidelines for Electricity Transmission Projects (EirGrid, 2015).

Archaeological sites and monuments are protected under the National Monument Act 1930 – 2014 primarily through inclusion in the Record of Monument and Places (RMP), the Register of Historic Monuments (RHM) and/or by being declared a National Monument. Section 2 of the National Monument Act 1930 - 2014 defines a National Monument as '*a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic, or archaeological interest attaching thereto*'. In addition, Section 8 of the Act states that the Minister may also place a Preservation Order on a monument '*which in his [the minister's] opinion is a national monument is in danger of being or is actually being destroyed, injured, or removed, or is falling into decay through neglect*'. It is illegal to demolish, or remove wholly or in part, a National Monument or disturb the ground within, around or in proximity to a National Monument, without written consent from the Minister (and/or the local authority if they are the owners or guardians).

Under Section 5 of the National Monuments (Amendment) Act 1987, an RHM is required to be established and maintained. Monuments included on the RHM are afforded statutory protection under this Act, of a similar level to Recorded Monuments (see below).

Section 12 (1) of the National Monuments (Amendment) Act 1994 requires the establishment and maintenance of an RMP. Sites included in the RMP are legally protected and are referred to as Recorded Monuments. The RMP is maintained by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage who have defined Zones of Notification around each Recorded Monument. Zones of Notification do not

define the extent of a site but are defined for the purposes of notification to the Minister under Section 12 of the National Monuments Act (1930-2004).

The Sites and Monuments Record (SMR) is the national database of the Archaeological Survey of Ireland (ASI) compiled and maintained by the NMS. The SMR details all sites where a monument is known to the ASI pre-dating AD 1700 and includes a selection of monuments from the post-AD 1700 period. The addition of a monument to the SMR does not, in itself, confer legal protection.

The Planning and Development Act 2000 sets out the conditions relating to the protection of architectural heritage. Structures of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest are protected under this Act, through their inclusion on the Record of Protected Structures (RPS) and are known as Protected Structures.

The Planning and Development Act 2000 as amended defines an Architectural Conservation Area (ACA) as 'a place, area, group of structures or townscape, taking account of building lines and heights, that:

- a) *is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value, or*
- b) *contributes to the appreciation of protected structures'* (Planning and Development Act, 2000, Part IV, Chapter II).

Development plans are required to include an objective to preserve the character of an ACA. In considering applications for permission for development within an ACA, the effect of a Proposed Project on the character of an ACA is a consideration for the planning authority. Both the Kildare County Development Plan 2017 – 2023<sup>2</sup> and Meath County Development Plan 2021 - 2027<sup>3</sup> include a list of ACAs protected under the Act.

Undertaken under the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 the National Inventory of Architectural Heritage (NIAH) is a nationwide survey of architectural heritage including buildings, structures, and historic gardens and design landscapes. Inclusion on the NIAH alone does not in itself confer legal protection. The NIAH includes an assessment of the significance of structures based on an appraisal of their contribution to architectural heritage. Significance ratings are: International, National, Regional, Local and Record Only. Structures which are considered of International, National, and Regional significance are recommended by the Minister to the relevant Local Authority for inclusion in their RPS.<sup>4</sup>

The Survey of Historic Gardens and Designed Landscapes, undertaken by the NIAH, includes the sites of demesne lands from First Edition Ordnance Survey maps and assesses the level of survival and change. These gardens and designed landscapes (GDLs) largely date from the post-medieval period when the lands surrounding large houses assumed an increasingly ornamental role providing a landscape setting for the house.<sup>5</sup>

## 2.2 Study Areas

In order to identify and quantify the archaeology, architectural heritage and cultural heritage constraints that may be impacted by the route options, including indirect impacts, a study area of 100m was established around the route option under consideration. A 100m study area is considered sufficient to identify impacts given any direct impacts would largely result from the excavation for the cable trench, joint boxes, and temporary launch and reception pits for directional drilling, and be focussed on the alignment of the route option. Any indirect impacts are anticipated to be temporary (lasting the duration of construction in each location) as the Proposed Project

<sup>2</sup> <https://www.kildare.ie/CountyCouncil/AllServices/Planning/DevelopmentPlans/KildareCountyDevelopmentPlan2017-2023/>.

<sup>3</sup> <https://consult.meath.ie/en/consultation/meath-adopted-county-development-plan>.

<sup>4</sup> Department of Culture, Heritage and the Gaeltacht, 2021, NIAH Handbook.

<sup>5</sup> <http://buildingsofireland.com/Surveys/Gardens/AShortHistory/> [Accessed 5.11.21].

would be largely located beneath road surfaces and offline sections would be reinstated after construction, localised along the wayleave corridor and are not anticipated beyond 100m.

The four route options and their 100m study areas are shown on Figures B.1.1 – B.1.4 (Appendix B.1).

## 2.3 Sources of Information

Baseline conditions for archaeology, architectural heritage and cultural heritage were established through desk-based research using the following sources of information:

- The archaeological and architectural features identified as part of the Environmental Constraints Report<sup>6</sup>, comprising National Monuments and sites with Preservation Orders placed on them, Recorded Monuments listed on the RMP, sites on the RHM, and sites recorded on the SMR, Protected Structures and structures on the NIAH, ACAs identified in the Kildare County Development Plan 2017 – 2023 and Meath County Development Plan 2021 – 2027, and GDLs identified from the Survey of Historic Gardens and Designed Landscapes;
- Modern aerial imagery, including Google, OSi Digital Globe, and EirGrid aerial photography;
- Historic aerial photographs available online<sup>7</sup>;
- Historic mapping available online, comprising:
  - The Down Survey of Ireland<sup>8</sup>;
  - Noble and Keenan’s map of Kildare (1752)<sup>9</sup>;
  - Larkin’s map of Meath (1812)<sup>10</sup>; and
  - Historic Ordnance Survey mapping (Ordnance Survey 6”, 1837 – 1842 and Ordnance Survey 25”, 1888 - 1913);
- Placename information available online<sup>11</sup>;
- The National Folklore Collection via the UCD digital library available online<sup>12</sup>;
- Topographical files of the National Museum of Ireland through the online National Museum of Ireland: Finds Database (up to 2010) available online<sup>13</sup>;
- Excavations Bulletin<sup>14</sup>; and
- Transport Infrastructure Ireland (TII) Archaeological Excavation Reports.<sup>15</sup>

Some archaeology, architectural heritage and cultural heritage constraints are entered separately on one or more datasets. Where constraints appear on more than one dataset these have been deconflicted to avoid double counting of constraints with its designation (or more significant designation) taking precedence as it affords the constraint legal protection. Where a constraint does appear on more than one dataset, this has been identified in Section 3 below and Annex A (Inventory of Archaeology, Architectural Heritage and Cultural Heritage Constraints).

<sup>6</sup> <https://consult.eirgrid.ie/system/files/materials/2055/Environmental%20Constraints%20Report%20-%20Step%204A%20-%20KMGU.pdf>.

<sup>7</sup> <https://www.cambridgeairphotos.com/>.

<sup>8</sup> <http://downsurvey.tcd.ie/index.html> [Accessed 05.11.21].

<sup>9</sup> <https://www.logainm.ie/Eolas/Data/Brainse/logainm.ie-map-j-noble-and-j-keenan-1752-grand-jury-kildare-south.jpg> and [logainm.ie-map-j-noble-and-j-keenan-1752-grand-jury-kildare-north.jpg \(4800x3501\)](https://www.logainm.ie/Eolas/Data/Brainse/logainm.ie-map-j-noble-and-j-keenan-1752-grand-jury-kildare-north.jpg) [Accessed 09.11.21].

<sup>10</sup> <https://www.logainm.ie/Eolas/Data/Brainse/logainm.ie-map-william-larkin-1812-grand-jury-meath-sheet-06.jpg> [Accessed 09.11.21].

<sup>11</sup> [www.loganim.ie](http://www.loganim.ie).

<sup>12</sup> <https://digital.ucd.ie/>.

<sup>13</sup> <http://heritagemaps.ie/>.

<sup>14</sup> <https://excavations.ie/> [Accessed November 2021].

<sup>15</sup> <https://repository.dri.ie/catalog> [Accessed November 2021].

In addition to a review of sources of recorded archaeological and architectural features identified as part of the Environmental Constraints Report, cultural heritage constraints within the study areas for each of the four route options were recorded, mapped and assessed through desk-based research using the sources identified above. Information from these sources has been incorporated into Section 3 below and in the Inventory of Archaeology, Architectural Heritage and Cultural Heritage Constraints (Annex A). Additional cultural heritage sites identified from these sources are also described in Sections 3.1.3, 3.2.3, 3.3.3, and 3.4.3 below. Cultural heritage will be looked into in more detail, including verifying the results of the desk study through field survey, at a later stage of the Proposed Project.

A unique reference number was assigned to each constraint identified from the sources listed above. Archaeological constraints are prefixed with 'AY' and architectural heritage constraints are prefixed with 'AH'. Demesne lands are prefixed with 'DL' and undesignated cultural heritage sites are prefixed with 'CH'. Archaeological, architectural heritage and cultural heritage constraints are identified in the sections below and are also shown on Figures B.1.1 – B.1.4 (Appendix B.1). Full details for the archaeology, architectural heritage and cultural heritage constraints identified are provided in Annex A (Inventory of Archaeology, Architectural Heritage and Cultural Heritage Constraints).

### 3. Receiving Environment

This section presents baseline information for the archaeology, architectural heritage and cultural heritage constraints within the study areas for each of the four route options.

A summary of archaeology, architectural heritage, and cultural heritage constraints identified within the Step 3 Project Study Area is presented in the Environmental Constraints Report<sup>16</sup> along with a discussion on the general character and nature of the constraints present.

Further details for the archaeology, architectural heritage and cultural heritage constraints identified within the study areas for each of the four route options are provided in Annex A (Inventory of Archaeology, Architectural Heritage and Cultural Heritage Constraints).

#### 3.1 Option A (Red)

##### 3.1.1 Archaeology

Archaeological constraints identified within the study area for Option A (Red) (see Annex A and Figure B.1.1 in Appendix B.1) comprise:

- One National Monument and three sites with Preservation Orders placed on them;
- One site on the RHM;
- Four Recorded Monuments; and
- Six sites recorded on the SMR.

##### National Monuments & Preservation Orders

There is one National Monument (AY\_39; also a Protected Structure, AH\_16) and three sites with Preservation Orders placed on them (AY\_40, AY\_42, and AY\_43) located within the study area for Option A (Red) (see Figure B.1.1 of Appendix B.1). These form part of the Jigginstown Castle complex, located approximately 40m to the west of Option A (Red). Two further sites with Preservation Orders placed on them (AY\_38, AY\_44; also a Protected Structure, AH\_17), approximately 195m and 230m to the west of Option A (Red) respectively, also form part of the complex.

Built by the Earl of Wentworth, Lord Lieutenant of Ireland, as a summer residence and to accommodate Charles I on royal visits to Ireland<sup>17</sup>, the complex includes the 17th century house (AY\_39) and gardens (AY\_43), enclosed within a large oval enclosure (AY\_42). Local legend states men formed a chain from Dublin to Naas and passed the bricks along the line to build the house, and that a tunnel leads from Jigginstown to Killashee.<sup>18</sup> The complex fronts directly onto the R445 to the north; however, is largely screened from the road to the east by established trees and vegetation.

<sup>16</sup> <https://consult.eirgrid.ie/system/files/materials/2055/Environmental%20Constraints%20Report%20-%20Step%204A%20-%20KMGU.pdf>.

<sup>17</sup> <https://kildare.ie/Heritage/historic-sites/jigginstown-castle.asp> [Accessed 25.10.21].

<sup>18</sup> <https://digital.ucd.ie/view-media/duchas:4819384/canvas?manifest=https://data.ucd.ie/api/img/manifests/duchas:4819384> [Accessed 04.11.21].

### Register of Historic Monuments

A total of six sites on the RHM have been identified within the study area for Option A (Red). Five of these sites (AY\_38, AY\_39, AY\_42, AY\_43, and AY\_44), form part of the Jigginstown Castle complex and, to avoid double counting constraints, have been included above under their more significant designations (see above).

A linear earthwork (AY\_13), located immediately to the east of Option A (Red), is also a Recorded Monument, (see below) and forms the townland boundary between Ballyloughan and Graiguepottle. Identified as 'The Pale' on historic mapping (Ordnance Survey 25", 1888 - 1913), and depicted as a narrow trackway, this monument may be part of a boundary constructed by the Anglo-Normans in the 14th century to divide their lands from those held by the Irish. Aerial photographs show an ephemeral ditch feature aligned north-south running adjacent to the R407, alongside the current field boundary.<sup>19</sup> Lydon has suggested that AY\_13 was by and large conceptual and may only have been fortified in parts.<sup>20</sup>

### Recorded Monuments

A total of four<sup>21</sup> Recorded Monuments are located within the study area for Option A (Red) (see Figure B.1.1 in Appendix B.1). These comprise:

- A mound (AY\_02), comprising a low circular earth mound, is located approximately 33m to the west of Option A (Red). The mound is depicted on historic mapping as a 'Mound' associated with 'Brides Well' (Ordnance Survey 6", 1837 – 1842). The mound was topped by a single ash tree<sup>22</sup>, until recent restoration to the well (AY\_01; a site recorded on the SMR; see below), appears to have removed the tree and included the erection of a post-and-rail fence around the top of the mound.
- A field system (AY\_03) of unknown date, approximately 3m to the east of Option A (Red), comprising the earthwork remains of a series of irregular fields. These features, identified from aerial photographs, are formed by banks and ditches and have been interpreted as the remains of ridge and furrow and possible trackways. The earthworks extend into the large field to the north.
- A poorly preserved rath (AY\_24), in Ballynagappagh, approximately 62m to the south-east of Option A (Red). Rathes are farmsteads of early medieval date enclosed by one or more banks and ditches, and AY\_24 comprises a low, circular earth bank, approximately 3.8m in width, with a possible entrance to the north. This monument is depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) as an oval earthwork, with a field boundary running along its eastern extent, and measures approximately 44m in length. Aerial imagery shows this monument to be overgrown with established vegetation.
- A 'moat' (AY\_26; also a Protected Structure) depicted on historic mapping (Ordnance Survey 25", 1888-1913), adjacent to the road through Firmount East, within the demesne lands of Moatfield House (DL\_15). This circular, round-topped, earth mound, located approximately 33m to the north-east of Option A (Red), may comprise the remains of a motte or Anglo-Norman defended homestead dating to the 12th and 13th centuries.<sup>23/24</sup> Topped with palisaded towers, these sites often had an associated enclosure (a bailey), which contained other buildings, attached. However, this area is overgrown, with a number of trees growing from the mound, and no evidence for a bailey was identified from aerial photographs of this location.

<sup>19</sup> <https://www.cambridgeairphotos.com/location/bdu041/> [Accessed 04.11.21].

<sup>20</sup> Lydon, J., 1973, *Ireland in the later Middle Ages*, pp. 130 – 133.

<sup>21</sup> A further Recorded Monument, a linear earthwork located immediately to the east of Option A (Red) (AY\_13), is also on the RHM and, to avoid double counting constraints, is described above.

<sup>22</sup> <https://digital.lucd.ie/view/duchas:49398> [Accessed 04.11.21].

<sup>23</sup> Department of the Environment, Heritage and Local Government, 2004, *Irish Field Monuments*.

<sup>24</sup> National Monuments Service, 2012, *Anglo-Norman castles*. Available online:

<https://www.archaeology.ie/sites/default/files/media/publications/nms-farmers-journal-10.pdf> [Accessed 25.10.21].

### Sites on the Sites and Monuments Record

A total of six sites recorded on the SMR have been identified within the study area for Option A (Red). These are the locations of cropmarks and evidence of post-medieval religious and domestic activity. The six sites recorded on the SMR within the study area for Option A (Red) are included in Table 3.1 and are shown on Figure B.1.1 (Appendix B.1).

Three further sites recorded on the SMR have not been included in Table 3.1. These comprise the site of two small pits identified during archaeological monitoring (AY\_07), the site of a midden (AY\_41) identified at Jigginstown Castle complex, and a redundant record (AY\_45). While AY\_07 and AY\_41 provide an indication of possible activity in these locations, given these sites have been removed and, in the case of AY\_07, the area developed, they are no longer constraints.

Table 3.1: Sites recorded on the SMR within the study area for Option A (Red)

Reference Number	SMR Reference	Description	Townland	Location (Easting / Northing)
AY_01	ME049-014001	A holy well (AY_01) depicted on historic mapping as 'Brides Well' (Ordnance Survey 6", 1837 – 1842) comprising a small natural spring at the centre of a low earth mound (AY_02; a Recorded Monument, see above). The well is described as one of the hot wells in Meath which sprung up when St Brigid rested in the location and is said to cure deafness. <sup>25</sup> The well has more recently been conserved and is now stone lined.	Calgath	689223 / 742511
AY_27	KD014-054	The present location of a square stone font found in the wall of the church in Clane.	Millicent Demesne	687361 / 725841
AY_36	KD019-081	A cropmark, approximately 80m to the west of Option A (Red), identified from aerial imagery measuring approximately 10m in diameter. The feature was interpreted as a ring ditch and may comprise the remains of a prehistoric funerary monument or hut circle. A further possible circular cropmark, of similar size and form, is visible on aerial imagery to the west, along with a number of linear features which correspond with historic field boundaries (Ordnance Survey 6", 1837 – 1842).	Osberstown	687886 / 722860
AY_46	KD024-050004	A group of small rectangular cropmarks, interpreted as enclosures, identified from aerial photographs, within approximately 6m of Option A (Red). These features are not depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888-1913) and no above ground remains remain extant. It is likely AY_46 – 48 have been removed or truncated as a result of the construction of the R412 and access track to Dunstown substation. These enclosures form part of a larger group, with further examples identified to the south-east.	Dunstown	687302 / 712740
AY_47	KD024-050005		Dunstown	687328 / 712725
AY_48	KD024-050006		Dunstown	687335 / 712719

### Archaeological Potential

Option A (Red) crosses the River Liffey and the Rye Water, as well as a number of minor watercourses. While the underlying geology is largely limestone, with superficial deposits of till and gravel, areas of alluvium, lake marl and

<sup>25</sup> 'St. Brigid's Well', *Ireland's Holy Wells County-by-County*. Available online: <https://ihwcbc.omeka.net/items/show/416> [Accessed 12.11.21].



raised peat have the potential to preserve previously unknown archaeological monuments and remains, including palaeoenvironmental remains and preserved organic materials. There is also the potential for votive offerings, objects apparently deposited for religious reasons, in rivers and bogs.

### 3.1.2 Architectural Heritage

Architectural heritage constraints within the study area for Option A (Red) comprise:

- Five Protected Structures (see Figure B.1.2 in Appendix B.1);
- One structure included on the NIAH (see Figure B.1.2 in Appendix B.1), assessed by the NIAH to be of Regional importance; and
- 12 GDLs (see Figure B.1.3 in Appendix B.1).

No ACAs have been identified within the study area for Option A (Red).

#### Record of Protected Structures

A total of five Protected Structures comprising post-medieval houses and a church have been identified within the study area for Option A (Red) (see Figure B.1.2 in Appendix B.1).

AH\_06 and AH\_11 comprise roadside houses with high-pitched thatched roofs constructed of unrefined local materials<sup>26,27</sup> dating to the 18th century. Both houses are also included on the NIAH and have been assessed by the NIAH to be of Regional importance. A thatched house in Moortown (AY\_06) overlooks Mooretown Drive, off the R407. While the view north is directly over the road, views in other directions are screened by the surrounding established vegetation and trees, and other residential buildings. Located in Ballynagappagh, AH\_11 comprises a single-storey range positioned perpendicular to the R408. The building forms part of a working farmyard and includes a later range depicted on historic mapping (Ordnance Survey 25", 1888-1913), and a low roadside boundary wall (approximately 0.6km in length) with two sets of gate piers to north-west, and a small modern lean-to. These buildings are located approximately 64m to the east and 20m to the south-east of Option A (Red) respectively.

A house identified as 'Millicent Estate Houses' on the RPS (AH\_15) is located approximately 7m to the north-east of Option A (Red) within Millicent Demesne (DL\_17; see below). The building comprises a square plan, two-storey house with a conservatory and outbuilding, both possibly of later date. While AH\_15 is shown as a 'lodge' on historic mapping (Ordnance Survey 25", 1888-1913), the plan of the current building differs from that depicted on the historic mapping and the building therefore may have been altered at a later date. The principal elevation of the house is to the south-east, with views across a private access track. Views in all directions are largely screened by trees and an established boundary hedge.

Bluebell Farm House (AH\_18), is located approximately 35m to the west of Option A (Red) and comprises a roadside three bay, two storey Victorian farm house. Historic mapping (Ordnance Survey 25", 1888 - 1913) depicts the house, and associated ranges forming a yard, enclosed by a boundary wall which surrounds the farm complex. The house forms part of a working farmyard with modern agricultural buildings to the west. Views from AH\_18 are across Kilcullen Road and are largely screened by a high rubblestone wall, immediately adjacent to the former alignment of the road.

Millicent Church and Lych Gate (AH\_12), is located approximately 44m to the north-east of Option A (Red) within Millicent House Demesne (DL\_17). Consecrated in 1883, the church comprises a Hiberno-Romanesque building, located on a rise towards the centre of the parish of Clane, with a square tower that is visible for some distance.

<sup>26</sup> <https://www.buildingsofireland.ie/buildings-search/building/11901001/moortown-celbridge-ed-kildare> [Accessed 25.10.21].

<sup>27</sup> <https://www.buildingsofireland.ie/buildings-search/building/11901401/ballynagappagh-clane-ed-kildare> [Accessed 25.10.21].

The lych gate comprises a covered gateway at the entrance of the graveyard where a coffin could be set down during a funeral until the celebrant arrived. The structure has a slate pitched roof with decorative ridge pieces and is the only entrance leading directly from the L2002 into the treelined graveyard. Despite its roadside location, the church is surrounded by established trees which largely screen it from the road.

#### Architectural Conservation Areas

There are no ACAs located within the study area for Option A (Red). The nearest ACA to the option is Naas ACA, located approximately 700m to the east of Option A (Red).

#### National Inventory of Architectural Heritage

Three post-medieval houses included on the NIAH have been identified within the study area for Option A (Red) and comprise a country house (AH\_01), and two thatched houses (AH\_06 and AH\_11). These houses have assessed by the NIAH to be of Regional importance. AH\_06 and AH\_11 are also Protected Structures (see descriptions above) and, to avoid double counting constraints, have been included above under Protected Structures.

Larch Hill House (AH\_01) comprises a five-bay two-storey country house, built in the late 18th century. The house is located within its demesne (DL\_04), which includes extant estate buildings such as the gate lodge, as well as rendered entrance piers with limestone wheel guards and cast-iron double gates on the R125.

#### Survey of Gardens and Designed Landscapes

A total of 12 GDLs have been identified within the study area for Option A (Red). Of these ten were recorded by the Survey of Historic Gardens and Designed Landscapes and two have been identified from historic mapping (Ordnance Survey 6", 1837 – 1842). Information on these GDLs is summarised in Table 3.2 and are shown on Figure B.1.3 (Appendix B.1).

Table 3.2: GDLs identified within the study area for Option A (Red)

Reference Number	Name	Description	Townland	NIAH Reference
DL_01	Glebe House	Demesne identified from historic mapping as 'Paget Priory' (Ordnance Survey 6", 1837 – 1842). Mature trees, hedges and a low stone boundary wall with cast iron railings mark the boundary with the R156 and R126. Roughcast and painted gate piers are located at the entrance on the junction of the R125 and R126, leading to a driveway as depicted on historic mapping.	Mullagh	N/A
DL_02	Jenkinstown House	Demesne identified from historic mapping (Ordnance Survey 6", 1837 – 1842). The principal house remains extant (CH_02), and the demesne includes a roughcast boundary wall, gate piers, and driveway leading to the house. Mature trees and a ditch mark the boundary along the R156.	Jenkinstown	N/A
DL_03	Phepotstown House	The GDL to Phepotstown House (CH_05), including principal house and ancillary buildings depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Retains elements of parkland and formal gardens, as well as original driveways and entrances with gate piers and cast-iron gates. Hedgerows and mature trees, as well as roughcast walling, form the boundaries.	Phepotstown	NIAH 5151
DL_04	Larch Hill House	The GDL to Larch Hill House (AH_01) which includes extant water features and woodland. Tradition notes a previous owner believed he would return after death as a fox so constructed a fox-cover in the grounds, although the location is unknown. Established trees and hedgerows bound the R125. A gated entrance with lodge house (with additional ancillary building) are also present and a low rubble stone wall runs from entrance to the carriageway. The southern boundary to the demesne comprises an established woodland belt.	Phepotstown	NIAH 5104
DL_05	Rodanstown House	Demesne associated with Rodanstown House. The boundaries of the demesne reflect those depicted on historic mapping (Ordnance Survey 6", 1837 – 1842); however, some estate features, including areas of woodland and boundary trees have been removed. Some development, including modern agricultural ranges, has taken place within the boundary. Roadside boundary features include roughcast and brick walls and low hedges.	Rodanstown	N/A
DL_07	Brides Stream House	The GDL to Bridestown House with legible features including areas of parkland and belts of trees. A lodge (CH_09) depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913) remains extant to the south; however, the driveway appears to be overgrown and disused. The boundary along the R125 comprises a low stone wall and ditch, with a mature hedgerow and tree line.	Calgath	NIAH 4983
DL_10	Painestown House	The GDL to Painestown House. The principal building appears to be ruinous, and a large amount of woodland depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) is no longer present. The R407 is bounded by established hedgerows and mature trees, with the entrances recessed from the carriageway.	Painestown	NIAH 1884
DL_14	Firmount House	The GDL to Firmount House, includes the principal building and other estate features such as the walled garden, parkland and some estate trees. The walled garden bounds the L2002 and includes a small pedestrian doorway directly onto the carriageway.	Firmount Demesne	NIAH 1882

Reference Number	Name	Description	Townland	NIAH Reference
		All entrances appear to have been modernised and the L2002 is largely bounded by modern post and rail fence, ditch and tree line.		
DL_15	Moatfield House	The GDL to Moatfield House, includes principal building (RPS B14-18), agricultural range, and a wide tree-lined avenue. A ditch and established hedgerow bound the L2002; however, modern entrances and boundary features, including post and rail fencing, are also present. The entrance to the demesne is recessed with rubble stone walls and a set of simple square gate piers.	Firmount East	NIAH 1883
DL_17	Millicent House	The GDL to Millicent House. The extensive riverside demesne lands surrounding the principal house (RPS B14-26) include extant estate features such as lodges (including AH_15), a walled garden, drives, and areas of woodland and parkland depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913). Sections of rubble stone wall delimit the demesne and line the road from the entrance to Millicent Bridge.	Millicent Demesne	NIAH 1889
DL_19	Osberstown Hill	The GDL to Osberstown Hill house. The principal building remains extant; however, the Dublin-Cork (and others) railway line has replaced the northern boundary and the Sallins Bypass has removed a section of the eastern corner.	Osberstown	NIAH 1887
DL_20	Killashee House	The GDL to Killashee House. Largely developed include Killashee National School, and the majority of demesne features have been removed. The R448 is located within the western boundary of the demesne. Extant boundary features include established hedgerows and a ditch, and modern post and rail fencing. A section of roughly coursed rubble stone wall is extant to the south of the demesne, along with a later recessed entrance.	Killashee	NIAH 1980

### **3.1.3 Cultural Heritage**

A total of 27 cultural heritage sites have been identified within the study area for Option A (Red) from the sources identified in Section 2. These comprise post-medieval built heritage including stone road bridges, houses and farm buildings. Summary information on these cultural heritage sites is presented in Table 3.3 below and are shown on Figure B.1.4 (Appendix B.1).

Table 3.3: Cultural heritage sites identified within the study area for Option A (Red)

Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
CH_01	694713 / 746280	Culcommon	Road Bridge	The western coursed, rubble stone parapet of a road bridge or culvert carrying a single lane carriageway over a small watercourse depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 2m to the east of Option A (Red).
CH_02	691765 / 745557	Warrenstown	House	'Jenkinstown House' depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) comprising the main house and a long range to north, approximately 65m to the north-west of Option A (Red). Principal elevation of house is south-east facing, towards the R156 - however, this is screened by a belt of established trees and vegetation.
CH_03	693262 / 745438	Jenkinstown	Public House	A public house depicted on historic mapping (Ordnance Survey 25", 1888-1913) comprising a one and a half storey, roughcast immediately adjacent to the R156, approximately 14m to the south-east of Option A (Red).
CH_04	691671 / 745333	Jenkinstown	Road Bridge	A low rubble stone bridge that carries the R156 across a small watercourse. Depicted on historic mapping as 'Jenkinstown Bridge' (Ordnance Survey 6", 1837 – 1842).
CH_05	689469 / 744597	Phepotstown	House	'Phepotstown House' depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) comprising a farmhouse with an attached long range and ancillary buildings. Located approximately 74m to the south of Option A (Red). Principal elevation of farmhouse towards the R125 to the north.
CH_06	689725 / 743478	Martinstown	Road Bridge	A stone road bridge depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888-1913) comprising two low parapets with alternate horizontal and vertical copes on the R125.
CH_07	689372 / 743057	Phepotstown; Calgath	Road Bridge	A stone road bridge depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888-1913) comprising two low stone parapets with rough vertical copes on the R125.
CH_10	689017 / 740938	Dolanstown	Farm	A farm depicted on depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888-1913). While some ranges remain extant, the complex has largely been replaced by more recent agricultural buildings. Located approximately 70m to the south-east of Option A (Red).
CH_11	689025 / 740886	Balfeaghan	House	A rendered two-storey house depicted on historic mapping (Ordnance Survey 25", 1888-1913), with low walled garden to north. A number of modern farm buildings are located to the south-east, and the house is largely screened from the R158 (approximately 20m to the west).
CH_12	688018 / 740642	Balfeaghan; Boycetown	Road Bridge	'Balfeaghan Bridge' depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), carries the R158 across the River Rye and the Meath-Kildare county boundary. The bridge comprises a slightly humped stone structure with parallel parapets and vertical roughly hewn copes.
CH_14	692931 / 739788	Commons West	Racecourse	The site of Commons West racecourse depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) as a sub-circular circuit with some small buildings to the south. The form of the racecourse remains perceptible however, some modern development has occurred.
CH_15	687572 / 739143	Commons South	House	A small single storey vernacular building with a corrugated metal roof depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Located within an overgrown plot on the R407 and L5028, approximately 24m to the west of Option A (Red).

Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
CH_16	687151 / 738719	Courtown Great	Lodge	A single storey rendered lodge located adjacent to a lane leading to Courtown House. The lodge is depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913) and is positioned perpendicular to the R407, approximately 24m to the south-east of Option A (Red).
CH_17	686497 / 738292	Portgloriam	Agricultural building	An agricultural range depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Later mapping identified the building as 'The Mount' (Ordnance Survey 25", 1888 - 1913). The building is positioned at an angle to the R407, set away from the road (approximately 44m to the south-east of Option A (Red)), amongst other later agricultural buildings.
CH_24	687121 / 733948	Baltracey	Road Bridge	A road bridge depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) carries the R407 over the Baltracey River. The bridge comprises a squared rubble stone structure with parallel parapets with squared blocks as copes.
CH_37	685351 / 729626	Betaghstown	House	A house on Betaghstown Cross Roads, depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913) comprising a rendered two storey house, with single storey attached range and later additions. Located approximately 9m to the west of Option A (Red), a low rendered boundary wall runs along the R408 and L1023.
CH_39	685606 / 727306	Firmount West	Farm	A complex of buildings positioned on Firmount Cross Roads depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913). The buildings are arranged around a courtyard with later buildings and additions. The main house faces onto the R403, with the junction with the L2002 and a local road adjacent. Located approximately 27m to the west of Option A (Red).
CH_41	685720 / 727075	Firmount West	Field barn	A single storey rendered field barn with corrugated gable roof. Positioned perpendicular to the L2002, approximately 12m to the east of Option A (Red).
CH_42	685788 / 726882	Firmount West	Outbuilding	A single storey stone outbuilding, depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913), partially missing roof, approximately 19m to the north-east of Option A (Red).
CH_43	685934 / 726668	Firmount Demesne	House	A single storey roughcast house, depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913), approximately 16m to the south-west of Option A (Red). A low stone boundary wall, bounds the L2002.
CH_46	687359 / 725731	Millicent South	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913), as a 'Vicarage'. Likely associated with Millicent Church and Lych Gate (AH_12). The church tower is glimpsed from plot; however, otherwise the house is largely screened by established trees and vegetation. Located approximately 24m to the south-west of Option A (Red).
CH_51	688232 / 719268	Jigginstown	Aqueduct	'Aqueduct' identified on historic mapping (Ordnance Survey 6", 1837 – 1842). Forms part of the Grand Canal, approximately 22m to the north-east of Option A (Red).
CH_55	688073 / 716071	Killashee	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). The house comprises a six bay, one and a half storey rendered building, with gabled roof. Located approximately 13m to the east of Option A (Red).



Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
CH_56	687962 / 715565	Oldtown	Farm	A farm depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) in a courtyard plan with later ranges added to the west. The complex includes a two-storey farmhouse, with gabled roof and a series of single storey ranges and a stone roadside wall along the R448. Located approximately 25m to the west of Option A (Red).
CH_57	687884 / 714478	Mylerstown	House	A single storey cottage depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) with later additions. The cottage is positioned on the R448, overlooking the road, approximately 14m to the east of Option A (Red).
CH_58	687418 / 713423	Stephenstown South	House	A cottage depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) comprising a half-thatched cottage with a high-pitched roof. The building has been subject to later additions and modification. The house is located on the roadside, with views across the junction between the R412 and R448, approximately 20m to the west of Option A (Red).
CH_59	687356 / 713137	Stephenstown South	House	A two-storey 'L'-shaped house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Positioned on the R412, approximately 23m to the west of Option A (Red).

### Previous Excavations

A review of Excavations Bulletin and TII's Archaeological Excavation Reports identified the following archaeological excavations in the Option A (Red) study area.

- Archaeological monitoring of road realignment works for the R407 (Licence number: 10E0445) in Portgloriam identified the foundation of a vernacular building depicted on the First Edition Ordnance Survey mapping (1840); however, the building had been removed by 1900;<sup>28</sup> and
- Archaeological monitoring and excavations in advance of proposed bridge redevelopment works at Kildare Bridge on the R157 in Maynooth (Licence number: 05E1090) identified the remains of a stone structure, possibly an outhouse or a coal-storage building, possibly dating to the 17th century.<sup>29</sup>

A further five archaeological excavations were also identified (under Licence numbers: 02E0148, 11E0309; 05E1334, 05E1334 ext., and 14E0452); however, these did not identify any archaeological remains or deposits of archaeological significance.

A total of four casual finds were also identified within the study area for Option A (Red), these comprise bronze pins and a fibula (1984: 5,6, and 1969:75) in Jigginstown and Naas West, as well as finds (1935:544-8 R.I.A.) associated with a cemetery of pit burials (KD019-017; a Recorded Monument) in Ploopluck, and a glazed medieval pot sheard (1979:13) in Jigginstown.

## **3.2 Option B (Green)**

### **3.2.1 Archaeology**

Archaeological constraints identified within the study area for Option B (Green) (see Annex A and Figure B.1.1 in Appendix B.1) comprise:

- Three Recorded Monuments; and
- Eight sites recoded on the SMR.

There are no National Monuments, sites with Preservation Orders placed on them, or sites on the RHM located within the study area for Option B (Green).

#### National Monuments & Preservation Orders

There are no National Monuments or sites with Preservation Orders placed on them located within the study area for Option B (Green). The nearest National Monument or site with a Preservation Order placed on it to Option B (Green) is Rathasker Castle and Enclosure (KD024-001001 and KD024-001002; both Preservation Orders), located approximately 350m to the south-east of Option B (Green).

#### Register of Historic Monuments

No sites on the RHM have been identified within the study area for Option B (Green). The nearest site on the RHM is a rath (ME050-005; also a Recorded Monument) in Lynaghstown, approximately 304m to the south-east of the option.

<sup>28</sup> <http://excavations.ie/report/2010/Kildare/0021615/> [Accessed 05.11.21].

<sup>29</sup> <http://excavations.ie/report/2005/Kildare/0013775/> [Accessed 05.11.21].

### Recorded Monuments

Three Recorded Monuments are located within the study area for Option B (Green) (see Figure B.1.1 in Appendix B.1) comprising:

- The site of a medieval parish church (AY\_04), located approximately 20m to the west of Option B (Green) in the townland of Rodanstown. The boundary of the site is defined by an earthen bank and stone wall enclosing an oval graveyard (AY\_05; a site recorded on the SMR; see below). The memorials within the graveyard largely date from the mid-18th century and the upstanding remains of a church (AH\_02; a Protected Structure; see below) are also probably of this date.
- A rath (AY\_24) in Ballynagappagh, approximately 62m to the south-east of Option B (Green) (see Section 3.1.1 above).
- A mound (AY\_26; also a Protected Structure) in Firmount East, approximately 33m to the north-east of Option B (Green) (see Section 3.1.1 above).

### Sites on the Sites and Monuments Record

A total of eight sites recorded on the SMR have been identified within the study area for Option B (Green). These are the locations of cropmarks and evidence of post-medieval religious activity. Information on these constraints are presented in Table 3.4 and they are shown on Figure B.1.1 in Appendix B.1.

Three further sites on the SMR have not been included in Table 3.4. These comprise the site of a fulacht fia (AY\_37) identified during the construction of the Millennium Park Western Link Road, the site of a midden (AY\_41) identified at Jigginstown Castle complex, and a redundant record (AY\_45). While AY\_37 and AY\_41 provide an indication of possible activity in these locations, given these sites have been removed and, in the case of AY\_37, the area developed, they are no longer constraints.

Table 3.4: Sites recorded on the SMR within the study area for Option B (Green)

Reference Number	SMR Reference	Description	Townland	Location (Easting / Northing)
AY_05	ME049-021001	An oval graveyard defined by an earth bank and stone wall, immediately adjacent to the road. The graveyard encircles the site of a medieval parish church; the memorials within the graveyard largely date from the mid-18th century and the ruinous church is also probably of this date.	Rodanstown	690573 / 741320
AY_06	ME049-021002	The location of an octagonal font, since removed.	Rodanstown	690580 / 741315
AY_10	KD005-036	A large circular cropmark, measuring approximately 44m in diameter in Laraghbryan East, approximately 50m to the south and 74m west of Option B (Green), interpreted as an enclosure.	Laraghbryan East	692023 / 737926
AY_27	KD014-054	The present location of a font (see Table 3.1 in Section 3.1.1 above).	Millicent Demesne	687361 / 725841
AY_36	KD019-081	A cropmark, interpreted as a ring ditch, approximately 80m to the west of Option B (Green) (see Table 3.1 in Section 3.1.1 above).	Osberstown	687886 / 722860
AY_46	KD024-050004		Dunstown	687302 / 712740

Reference Number	SMR Reference	Description	Townland	Location (Easting / Northing)
AY_47	KD024-050005	A group of small rectangular cropmarks, interpreted as enclosures, within approximately 6m of Option B (Green) (see Table 3.1 in Section 3.1.1 above).	Dunstown	687328 / 712725
AY_48	KD024-050006		Dunstown	687335 / 712719

### Archaeological Potential

Option B (Green) crosses the River Lyreen and River Liffey, as well as a number of minor watercourses. The underlying geology is largely limestone, with superficial deposits of till and gravel, as well as alluvium which has the potential to preserve previously unknown archaeological monuments and remains. There is also the potential for votive (religious) offerings in rivers and bogs. Areas of outcropping bedrock (visible exposures of solid rock) have also been noted along the route of Option B (Green) and the potential for previously unknown archaeological monuments and remains in these areas would be limited.

## 3.2.2 Architectural Heritage

Architectural heritage constraints within the study area for Option B (Green) comprise:

- Six Protected Structures (see Figure B.1.2 in Appendix B.1); and
- Eight GDLs (see Figure B.1.3 in Appendix B.1).

No ACAs have been identified within the study area for Option B (Green).

### Record of Protected Structures

Six Protected Structures have been identified within the study area for Option B (Green). These comprise post-medieval churches and houses. Protected Structures identified within the study area for Option B (Green) are shown on Figure B.1.2 (Appendix B.1).

A ruinous church (AH\_02), set within the graveyard (AY\_05; see above) in Rodanstown, is located approximately 10m to the west of Option B (Green). On the site of a medieval parish church (AY\_04), the roofless structure comprises a single storey, rectangular stone church with a large apse and blocked arched windows. A church is depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) as a rectangular building, orientated north-west to south-east; however, later mapping (Ordnance Survey 25", 1888 - 1913) shows the curved apse, as well as the east-west orientation, of the current structure. The church is located in an elevated position, overlooking the bend in the road, surrounded by a number of memorials within the graveyard and enclosed by a low rough-cast roadside wall. Views to the south and west are limited by a mature belt of trees.

Donaghstown Catholic Church (AH\_04) and Catholic Church of the Sacred Heart (AH\_05) are Protected Structures which also have been assessed by the NIAH to be of Regional importance. Built in a modest Gothic-style, both churches are on historic mapping (Ordnance Survey 25", 1888 - 1913), labelled 'R.C. Church'; however, only a church in Rathcoffey North is depicted on earlier mapping (Ordnance Survey 6", 1837 – 1842) as a 'chapel'. Donaghstown Catholic Church is located on a wedge of land on the junction between the R408 and L5037 and is bounded by a low coursed rubblestone wall, and landscaped grounds. The Catholic Church of the Sacred Heart is set back from the R408 within its associated grounds, with views outward limited by established trees and vegetation.

Ballynagappagh (AH\_11), Millicent Church and Lych Gate (AH\_12), and 'Millicent Estate Houses' (AH\_15) - Millicent Demesne lodge are Protected Structures which are located within the study area for Option B (Green) and also located within the study area for Option A (Red). These Protected Structures are described in Section 3.1.2.

#### Architectural Conservation Areas

There are no ACAs located within the study area for Option B (Green). The nearest ACA to the option is Maynooth ACA, located approximately 1.2km to the east of Option B (Green).

#### National Inventory of Architectural Heritage

Three structures included on the NIAH have been identified within the study area for Option B (Green). These comprise two post-medieval churches (AH\_04 and AH\_05) and a thatched house (AH\_11). These buildings are also Protected Structures and, to avoid double counting constraints, have been included above under Protected Structures.

#### Survey of Gardens and Designed Landscapes

Eight GDLs have identified within the study area for Option B (Green). Of these seven were recorded by the Survey of Historic Gardens and Designed Landscapes and one has been identified from historic mapping (Ordnance Survey 6", 1837 – 1842). Information on these GDLs is summarised in Table 3.5 and are shown on Figure B.1.3 (Appendix B.1).

Table 3.5: GDLs identified within the study area for Option B (Green)

Reference Number	Name	Description	Townland	NIAH Reference
DL_02	Jeninstown House	Demesne identified from historic mapping (Ordnance Survey 6", 1837 – 1842). The principal house remains extant (CH_02), and the demesne includes a roughcast boundary wall, gate piers, and driveway leading to the house. Mature trees and a ditch mark the boundary along the R156.	Jeninstown	N/A
DL_05	Rodanstown House	Demesne associated with Rodanstown House. The boundaries of the demesne reflect those depicted on historic mapping (Ordnance Survey 6", 1837 – 1842); however, some estate features, including areas of woodland and boundary trees have been removed. Some development, including modern agricultural ranges, has taken place within the boundary. Roadside boundary features include roughcast and brick walls and low hedges.	Rodanstown	N/A
DL_11	Rathcoffey House	Garden and designed landscape to Rathcoffey House. While the principal building is ruinous, the boundary of the site is still perceptible. However, the area is largely agricultural, and fields have been consolidated. Historic divisions (such as the garden boundary) remain perceptible as cropmarks on aerial imagery. The drive off School Road remains on the same alignment.	Rathcoffey Demesne	NIAH 1894
DL_14	Firmount House	The GDL to Firmount House, includes the principal building and other estate features such as the walled garden, parkland and some estate trees. The walled garden bounds the L2002 and includes a small pedestrian doorway directly onto the carriageway. All entrances appear to have been modernised and the L2002 is largely bounded by modern post and rail fence, ditch and tree line.	Firmount Demesne	NIAH 1882
DL_15	Moatfield House	The GDL to Moatfield House, includes principal building (RPS B14-18), agricultural range, and a wide tree-lined avenue. A ditch and established hedgerow bound the L2002; however, modern entrances and boundary features, including post and rail fencing, are also present. The entrance to the demesne is recessed with rubble stone walls and a set of simple square gate piers.	Firmount East	NIAH 1883
DL_17	Millicent House	The GDL to Millicent House. The extensive riverside demesne lands surrounding the principal house (RPS B14-26) include extant estate features such as lodges (including AH_15), a walled garden, drives, and areas of woodland and parkland depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913). Sections of rubble stone wall delimit the demesne and line the road from the entrance to Millicent Bridge.	Millicent Demesne	NIAH 1889
DL_19	Osberstown Hill	The GDL to Osberstown Hill house. The principal building remains extant; however, the Dublin-Cork (and others) railway line has replaced the northern boundary and the Sallins Bypass has removed a section of the eastern corner.	Osberstown	NIAH 1887
DL_20	Killashee House	The GDL to Killashee House. Largely developed include Killashee National School, and the majority of demesne features have been removed. The R448 is located within the western boundary of the demesne. Extant boundary features include established hedgerows and a ditch, and modern post and rail fencing. A section of roughly coursed rubble stone wall is extant to the south of the demesne, along with a later recessed entrance.	Killashee	NIAH 1980

### **3.2.3 Cultural Heritage**

A total of 27 cultural heritage sites have been identified within the study area for Option B (Green) from the sources identified in Section 2. These largely comprise post-medieval built heritage including houses and farm buildings. Summary information on these cultural heritage sites is presented in Table 3.6 below and are shown on Figure B.1.4 (Appendix B.1).



Table 3.6: Cultural heritage sites identified within the study area for Option B (Green)

Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
CH_01	694713 / 746280	Culcommon	Road Bridge	The stone parapet of a road bridge or culvert depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 2m to the east of Option B (Green) (see Table 3.3 in Section 3.1.3 above).
CH_02	691765 / 745557	Warrenstown	House	'Jenkinstown House' depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) comprising the main house and a long range to north, approximately 65m to the north-west of Option B (Green) (See Table 3.3 in Section 3.1.3 above).
CH_03	693262 / 745438	Jenkinstown	Public House	A public house depicted on historic mapping (Ordnance Survey 25", 1888-1913) immediately adjacent to the R156, approximately 14m to the south-east of Option B (Green) (See Table 3.3 in Section 3.1.3 above).
CH_04	691671 / 745333	Jenkinstown	Road Bridge	A stone road bridge that carries the R156 across a small watercourse - depicted on historic mapping as 'Jenkinstown Bridge' (Ordnance Survey 6", 1837 – 1842) (see Table 3.3 in Section 3.1.3 above).
CH_08	690331 / 742110	Rodanstown	Mill Dam	'Old Mill Dam' depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), north of Rodanstown House. Located within two undeveloped agricultural fields adjacent to the road, no features associated with the mill were visible on aerial imagery.
CH_09	690365 / 741843	Dolanstown	Lodge	A small single storey lodge building depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913), and associated with Bridestream House. Located within an overgrown plot adjacent to entrance to the demesne (DL_07) with a farm entrance to south. Located approximately 21m to the west of Option B (Green).
CH_18	692330 / 737877	Laraghbryan East	Earthworks	Linear banks and ditches in a field to the north of Kilcock Road, immediately to the east of Option B (Green), identified from historic aerial photographs. <sup>30</sup> Possibly associated with AY_10 (a large circular enclosure), or a nearby ecclesiastical site (KD005-021).
CH_19	691947 / 737649	Laraghbryan East	Bridge	The site of a possible bridge or crossing point over the River Lyreen, approximately 88m to the west of Option B (Green), depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). No corresponding features are visible on modern aerial imagery.

<sup>30</sup> <https://www.cambridgeairphotos.com/location/ape008/> [Accessed 07.11.21].

Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
CH_21	691258 / 736597	Crinstown	Farm	A farm complex depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), only the farmhouse remains extant. The house comprises a three bay, two storey structure with gable stacks, approximately 19m to the west of Option B (Green).
CH_26	689693 / 733526	Graiguesallagh	Farm	A farm complex depicted on historic mapping (Ordnance Survey 6", 1837 – 1842); however, the current layout reflects the layout depicted on later mapping (Ordnance Survey 25", 1888 - 1913). The complex includes a square plan house with long L'-shaped range to south-south-west. A boundary wall of similar stone is located adjacent to the R408, approximately 23m to the west of Option B (Green).
CH_28	689117 / 732739	Rathcoffey North	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), with a later house located immediately to the south (Ordnance Survey 25", 1888 - 1913). Positioned adjacent to the R408 and L5046, approximately 23m to the east of Option B (Green).
CH_30	688156 / 732339	Rathcoffey North	House	A roadside building, immediately overlooking R408, depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) with two perpendicular ranges; however, these have since been demolished and the area redeveloped. The house comprises a four bay, two storey stone house with a surrounding boundary wall of similar material.
CH_31	688190 / 732277	Rathcoffey South	House	A five bay, two storey house with hipped roof and central stack depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Located off the L50351, approximately 50m to the south-east of Option B (Green).
CH_37	685351 / 729626	Betaghstown	House	A house on Betaghstown Cross Roads, depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913), approximately 9m to the west of Option B (Green) (see Table 3.3 in Section 3.1.3 above).
CH_39	685606 / 727306	Firmount West	Farm	A complex of buildings positioned on Firmount Cross Roads depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913), located approximately 27m to the west of Option B (Green) (see Table 3.3 in Section 3.1.3 above).
CH_41	685720 / 727075	Firmount West	Field barn	A single storey rendered field barn with corrugated gable roof approximately 12m to the east of Option B (Green) (see Table 3.3 in Section 3.1.3 above).
CH_42	685788 / 726882	Firmount West	Outbuilding	A single storey stone outbuilding, depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913), approximately 19m to the north-east of Option B (Green) (see Table 3.3 in Section 3.1.3 above).

Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
CH_43	685934 / 726668	Firmount Demesne	House	A house, depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913), approximately 16m to the south-west of Option B (Green) (see Table 3.3 in Section 3.1.3 above).
CH_46	687359 / 725731	Millicent South	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913), as a 'Vicarage', approximately 24m to the south-west of Option B (Green) (see Table 3.3 in Section 3.1.3 above).
CH_52	687422 / 718375	Jigginstown	Field boundaries	Cropmarks comprising two, roughly parallel linear features, a smaller rectangular feature, and possible cultivation marks identified from aerial imagery. The linear features correspond to a field boundary depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), but not later mapping (Ordnance Survey 25", 1888 - 1913). The field to the north includes a north-south linear and a circular feature north of the existing field boundary - no corresponding features on historic mapping.
CH_53	687650 / 718026	Jigginstown	Field boundaries	A linear cropmark interpreted as a former field boundary identified from aerial imagery. Corresponds with a field boundary depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Perpendicular linear features were also identified and interpreted as possible cultivation marks. Located approximately 40m to the east of Option B (Green).
CH_54	688148 / 717337	Rathasker	House	A small house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), located on Rathasker Road approximately 43m to the south of Option B (Green).
CH_55	688073 / 716071	Killashee	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 13m to the east of Option B (Green) (see Table 3.3 in Section 3.1.3 above).
CH_56	687962 / 715565	Oldtown	Farm	A farm depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 25m to the west of Option B (Green) (see Table 3.3 in Section 3.1.3 above).
CH_57	687884 / 714478	Mylerstown	House	A single storey cottage depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 14m to the east of Option B (Green) (see Table 3.3 in Section 3.1.3 above).
CH_58	687418 / 713423	Stephenstown South	House	A cottage depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) located on the roadside, approximately 20m to the west of Option B (Green) (see Table 3.3 in Section 3.1.3 above).

Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
CH_59	687356 / 713137	Stephenstown South	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 23m to the west of Option B (Green) (see Table 3.3 in Section 3.1.3 above).

### Previous Excavations

A review of Excavations Bulletin and TII's Archaeological Excavation Reports identified the following archaeological excavations in the Option B (Green) study area.

- Archaeological monitoring in Rathcoffey North (Licence number: 03E1005) for the ground works for a mobile phone mast identified a large quantity of medieval pottery and a metallated surface, along with a pit, gully, and slag;<sup>31</sup>
- Archaeological monitoring and excavations in advance of proposed bridge redevelopment works at Kildare Bridge on the R157 in Maynooth (Licence number: 05E1090) identified the remains of a stone structure, possibly an outhouse or a coal-storage building, were identified possibly dating to the 17th century;<sup>32</sup>
- Archaeological testing for a business park in Jigginstown (Licence number: 02E0672) identified a single flint flake;<sup>33</sup> and
- Archaeological excavations undertaken as part of investigations at Jigginstown Castle (Licence number: 02E1603) identified evidence of post-medieval construction debris and material.<sup>34</sup>

A further five archaeological excavations were also identified (under Licence numbers: 11E0309, 09E0148, 02E1751, 04E0073, and 04E1338); however, these did not identify any archaeological remains or deposits of archaeological significance.

A total of two casual finds were also identified within the study area for Option B (Green), these comprise finds (1935:544-8 R.I.A.) associated with a cemetery of pit burials (KD019-017; Recorded Monument) in Ploopluck, and 'various archaeological finds' (E 412:1) in Crinstown.

## **3.3 Option C (Orange)**

### **3.3.1 Archaeology**

Archaeological constraints identified within the study area for Option C (Orange) (see Annex A and Figure B.1.1 in Appendix B.1) comprise:

- Three Recorded Monuments; and
- 15 sites recorded on the SMR.

There are no National Monuments, sites with Preservation Orders placed on them, or sites on the RHM located within the study area for Option C (Orange).

#### National Monuments & Preservation Orders

There are no National Monuments or sites with Preservation Orders placed on them located within the study area for Option C (Orange). The nearest National Monument or site with a Preservation Order placed on it to the option is Rathasker Castle and Enclosure (KD024-001001 and KD024-001002; both Preservation Orders), located approximately 350m to the south-east of Option C (Orange).

<sup>31</sup> <http://excavations.ie/report/2003/Kildare/0010019/> [Accessed 05.11.21].

<sup>32</sup> <http://excavations.ie/report/2005/Kildare/0013775/> [Accessed 05.11.21].

<sup>33</sup> <https://excavations.ie/report/2002/Kildare/0008229/> [Accessed 05.11.21].

<sup>34</sup> <https://excavations.ie/report/2002/Kildare/0008231/> [Accessed 05.11.21].

### Register of Historic Monuments

No sites on the RHM have been identified within the study area for Option C (Orange). The nearest site on the RHM is a rath (ME050-005; also a Recorded Monument) in Lynaghstown, over 300m to the south-east of the route option.

### Recorded Monuments

Three Recorded Monuments are located within the study area for Option C (Orange) (see Figure B.1.1 in Appendix B.1). These comprise the site of a medieval parish church (AY\_04) which has already been described in Section 3.2.1 above, and two enclosures identified from aerial photographs (AY\_14 and AY\_17). The enclosure in Donaghstown (AY\_14) comprises a long, narrow, sub-rectangular feature, approximately 80m to the east of Option C (Orange). The large enclosure in Roosk (AY\_17), measuring approximately 120m in diameter, comprises an ephemeral fosse located approximately 98m to the east of Option C (Orange).

### Sites on the Sites and Monuments Record

A total of 15 sites recorded on the SMR have been identified within the study area for Option C (Orange). These comprise the locations of cropmarks and evidence of medieval and post-medieval religious activity. These are included in Table 3.7 and are shown on Figure B.1.1 (Appendix B.1).

Two further sites on the SMR have not been included in Table 3.7. These comprise the site of a fulacht fia (AY\_37) identified during the construction of the Millennium Park Western Link Road and a redundant record (AY\_45). While the former provides an indication of possible prehistoric activity in this location, given this site has been removed and the area developed it is no longer a constraint.

Table 3.7: Sites recorded on the SMR within the study area for Option C (Orange)

Reference Number	SMR Reference	Description	Townland	Location (Easting / Northing)
AY_05	ME049-021001	An oval graveyard defined by an earth bank and stone wall, immediately adjacent to the road (see Table 3.4 in Section 3.2.1 above).	Rodanstown	690573 / 741320
AY_06	ME049-021002	The location of an octagonal font, since removed (see Table 3.4 in Section 3.2.1 above).	Rodanstown	690580 / 741315
AY_10	KD005-036	A large circular cropmark interpreted as an enclosure, approximately 50m to the south and 74m west of Option C (Orange) (see Table 3.4 in Section 3.2.1 above).	Laraghbryan East	692023 / 737926
AY_25	KD014-059	A cropmark of a curvilinear enclosure, measuring approximately 58m in diameter, approximately 56m to the south-east of Option C (Orange).	Ladycastle Upper	690311 / 727931
AY_29	KD014-041003	The location of a 13th century stone baptismal font.	Bodenstown	689044 / 724810
AY_30	KD014-041001	A ruinous medieval church comprising a rectangular structure with three extant walls of roughly dressed, uncoursed limestone. Historic mapping identified the church 'in ruins' (Ordnance Survey 25", 1888 - 1913). The church is located within its associated enclosed graveyard (AY_31), approximately 26m to the south of Option C (Orange). The monuments surrounding the church date to the post-medieval period.	Bodenstown	689044 / 724808

Reference Number	SMR Reference	Description	Townland	Location (Easting / Northing)
AY_31	KD014-041002	A square enclosed graveyard located to the south of the L2010 in Bodenstown. The associated church (AY_30) retains 14th century building material; however, the monuments within the graveyard date to the post-medieval period and include a memorial to Wolfe Tone (1763 – 1798), a leader of the 1798 rebellion.	Bodenstown	689044 / 724781
AY_32	KD014-062	A cluster of possible barrows (AY_32, AY_33, and AY_34, approximately 55m to the north, 40m to the south, and 94m to the south of Option C (Orange), respectively) identified from aerial imagery comprising circular cropmarks between approximately 7m and 12m in diameter.	Castlesize	688409 / 724218
AY_33	KD014-073		Castlesize	688644 / 724200
AY_34	KD014-076		Castlesize	688590 / 724128
AY_35	KD014-074	A cropmark identified from aerial imagery and interpreted as a large circular enclosure, measuring approximately 90m in diameter. Located approximately 40m to the south-east of Option C (Orange), close to a group of barrows (AY_32 – 34).	Castlesize	688419 / 724116
AY_36	KD019-081	A cropmark, interpreted as a ring ditch, approximately 80m to the west of Option C (Orange) (see Table 3.1 in Section 3.1.1 above).	Osberstown	687886 / 722860
AY_46	KD024-050004	A group of small rectangular cropmarks, interpreted as enclosures, within approximately 6m of Option C (Orange) (see Table 3.1 in Section 3.1.1 above).	Dunstown	687302 / 712740
AY_47	KD024-050005		Dunstown	687328 / 712725
AY_48	KD024-050006		Dunstown	687335 / 712719

### Archaeological Potential

Option C (Orange) crosses the Rye Water, River Lyreen and the River Liffey (twice), as well as a number of minor watercourses. The underlying geology is largely limestone, with superficial deposits of till, gravel and alluvium, as well as lacustrine sediments in Donaghstown. Alluvium and lacustrine deposits have the potential to preserve previously unknown archaeological monuments and remains, including organic and palaeoenvironmental remains, and there is also the potential for votive (religious) offerings in rivers and bogs. Outcropping bedrock (visible exposures of solid rock) has also been noted along the route of Option C (Orange) and the potential for previously unknown archaeological monuments and remains in these areas would be limited.

### 3.3.2 Architectural Heritage

Architectural heritage constraints within the study area for Option C (Orange) comprise:

- Four Protected Structures (see Figure B.1.2 in Appendix B.1); and
- Eight GDLs (see Figure B.1.3 in Appendix B.1).

No ACAs or structures included on the NIAH have been identified within the study area for Option C (Orange).



### Record of Protected Structures

Four Protected Structures have been identified within the study area for Option C (Orange), comprising post-medieval churches and estate buildings. Protected Structures identified within the study area for Option C (Orange) are shown on Figure B.1.2 (Appendix B.1).

Irishtown House (AH\_10) is located within its associated demesne lands (DL\_12) and comprises a double pile structure with two additional gable bays extending to the east and west, as depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). The house is set within a private garden, overlooking the River Liffey, with a trackway and working farm to the east. Views to the south are across the garden towards the river, and north over pasture fields.

A ruined medieval church (AH\_13) within its associated enclosed square graveyard (AY\_31) is located approximately 26m to the south of Option C (Orange), south of the L2010 in Bodenstown. The church retains original 14th century building material comprising the western gable and sections of rubble stone wall, and a font (AY\_29) of possible 13th century date was also recovered from the structure. However, the monuments surrounding the church date to the post-medieval period and include a memorial to Wolfe Tone (1763 – 1798), a leader of the 1798 rising.

The Gate Lodge and entrance gates/walls to east of Castlesize House (AY\_14) is located approximately 28m to the north-west of Option C (Orange). Castlesize House (RPS B14-13) itself is located approximately 188m to the west of Option C (Orange). The lodge is located to the north of the driveway to the main house at the eastern entrance to the Castlesize GDL (DL\_18) and is depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913). The lodge is set behind a high stone boundary wall, surrounded by mature trees and established vegetation.

In addition, the ruinous post-medieval church (AH\_02) in Rodanstown, located approximately 16m to the south-east of Option C (Orange), is also located within the study area for Option B (Green) (see Section 3.2.2 above).

### Architectural Conservation Areas

There are no ACAs located within the study area for Option C (Orange). The nearest ACA to the route option is Maynooth ACA, located approximately 1.2km to the east of Option C (Orange).

### National Inventory of Architectural Heritage

There are no structures included on the NIAH located within the study area for Option C (Orange). The nearest structure included on the NIAH to the route option is Limerick Bridge (NIAH 11901903), assessed by the NIAH to be of Regional importance, located approximately 170m to the north-east of Option C (Orange).

### Survey of Gardens and Designed Landscapes

A total of eight GDLs have been identified within the study area for Option C (Orange). Of these five have been identified from the Survey of Historic Gardens and Designed Landscapes and three have been identified from historic mapping (Ordnance Survey 6", 1837 – 1842). Information on these eight GDLs is presented in Table 3.8 and are shown on Figure B.1.3 (Appendix B.1).

Table 3.8: GDLs identified within the study area for Option C (Orange)

Reference Number	Name	Description	Townland	NIAH Reference
DL_02	Jeninstown House	Demesne identified from historic mapping (Ordnance Survey 6", 1837 – 1842). The principal house remains extant (CH_02), and the demesne includes a roughcast boundary wall, gate piers, and driveway leading to the house. Mature trees and a ditch mark the boundary along the R156.	Jeninstown	N/A
DL_05	Rodanstown House	Demesne associated with Rodanstown House. The boundaries of the demesne reflect those depicted on historic mapping (Ordnance Survey 6", 1837 – 1842); however, some estate features, including areas of woodland and boundary trees have been removed. Some development, including modern agricultural ranges, has taken place within the boundary. Roadside boundary features include roughcast and brick walls and low hedges.	Rodanstown	N/A
DL_12	Irishtown House	A large portion of this demesne has been redeveloped as a golf course. The principal building (AH_10) remains extant, as well as a pigeon house depicted on historic mapping (Ordnance Survey 25", 1888 - 1913) to the west.	Ladycastle Lower; Irishtown Lower	NIAH 1900
DL_13	Ladycastle	Demesne lands south of the River Liffey. Depicted as large areas of open parkland, a large portion of this demesne has been redeveloped as a golf course.	Ladycastle Upper	N/A
DL_16	Blackhall	The GDL associated with Blackhall. The principal building and agricultural ranges remain extant, along with the layout of the gardens and woodland, including a belt of trees along boundary with the R407.	Blackhall	NIAH 1890
DL_18	Castlesize	The GDL associated with Castlesize which largely retains the buildings and layout as depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). The entrance opposite the junction between the R407 and Castlesize Green includes entrance walls, gate piers, and cast-iron gates. The boundary along the R407 comprises a rubblestone wall with alternate vertical and horizontal copes.	Castlesize	NIAH 1893
DL_19	Osberstown Hill	The GDL to Osberstown Hill house. The principal building remains extant; however, the Dublin-Cork (and others) railway line has replaced the northern boundary and the Sallins Bypass has removed a section of the eastern corner.	Osberstown	NIAH 1887
DL_20	Killashee House	The GDL to Killashee House. Largely developed include Killashee National School, and the majority of demesne features have been removed. The R448 is located within the western boundary of the demesne. Extant boundary features include established hedgerows and a ditch, and modern post and rail fencing. A section of roughly coursed rubble stone wall is extant to the south of the demesne, along with a later recessed entrance.	Killashee	NIAH 1980

### **3.3.3 Cultural Heritage**

A total of 27 cultural heritage sites identified within the study area for Option C (Orange) from the sources identified in Section 2. These largely comprise extant post-medieval buildings and structures, including road bridges, houses and farm buildings. Summary information on these cultural heritage sites is presented in Table 3.9 below and are shown on Figure B.1.4 (Appendix B.1).

Table 3.9: Cultural heritage sites identified within the study area for Option C (Orange)

Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
CH_01	694713 / 746280	Culcommon	Road Bridge	The stone parapet of a road bridge or culvert depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 2m to the east of Option C (Orange) (see Table 3.3 in Section 3.1.3 above).
CH_02	691765 / 745557	Warrenstown	House	'Jenkinstown House' depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) comprising the main house and a long range to north, approximately 65m to the north-west of Option C (Orange) (See Table 3.3 in Section 3.1.3 above).
CH_03	693262 / 745438	Jenkinstown	Public House	A public house depicted on historic mapping (Ordnance Survey 25", 1888-1913) immediately adjacent to the R156, approximately 14m to the south-east of Option C (Orange) (See Table 3.3 in Section 3.1.3 above).
CH_04	691671 / 745333	Jenkinstown	Road Bridge	A stone road bridge that carries the R156 across a small watercourse - depicted on historic mapping as 'Jenkinstown Bridge' (Ordnance Survey 6", 1837 – 1842) (see Table 3.3 in Section 3.1.3 above).
CH_08	690331 / 742110	Rodanstown	Mill Dam	The site of 'Old Mill Dam' depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), no features associated with the mill were visible on aerial imagery (see Table 3.6 in Section 3.2.3 above).
CH_09	690365 / 741843	Dolanstown	Lodge	A lodge depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888-1913), located approximately 21m to the west of Option C (Orange) (see Table 3.6 in Section 3.2.3 above).
CH_18	692330 / 737877	Laraghbryan East	Earthworks	Linear banks and ditches in a field to the north of Kilcock Road, identified from historic aerial photographs (see Table 3.6 in Section 3.2.3 above).
CH_19	691947 / 737649	Laraghbryan East	Bridge	The site of a possible bridge or crossing point over the River Lyreen, approximately 88m to the west of Option C (Orange), depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) (see Table 3.6 in Section 3.2.3 above).
CH_21	691258 / 736597	Crinstown	Farm	A farm complex depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), only the farmhouse remains extant, approximately 19m to the west of Option C (Orange) (see Table 3.6 in Section 3.2.3 above).

Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
CH_22	691777 / 734898	Donaghstown	Bridge	A possible bridge or historic crossing over an unnamed watercourse depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 25m to the west of Option C (Orange).
CH_23	691783 / 734648	Donaghstown	Building	A small rectangular building depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) adjacent to the L5037, approximately 25m to the east of Option C (Orange). The plot is now densely wooded.
CH_25	691356 / 733724	Bryanstown	Enclosure	A series of cropmarks in an agricultural field identified from aerial imagery. Features include a small possible rectilinear enclosure near the eastern field boundary and two possible pits. No corresponding features were identified on historic mapping. Located immediately to the west of Option C (Orange).
CH_27	690854 / 733168	Smithstown	Building	Farm buildings depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Two ranges remain extant, incorporated into other buildings, with later buildings forming part of the complex. Set back from a local road, approximately 61m to the south of Option C (Orange).
CH_32	690510 / 731928	Johninstown	Building	A small rectangular building, possible agricultural, depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) adjacent to the L5046, approximately 21m to the south of Option C (Orange).
CH_44	689320 / 726235	Littlerath	Water feature	A sub-circular water feature with an associated small square building depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Later mapping (Ordnance Survey 25", 1888-1913) identified the areas as a disused quarry. While the building appears to have been removed, the body water remains extant. Located immediately to the west of the L6003.
CH_47	689213 / 725435	Ladyhill	House	Two ranges depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) which appear to have been incorporated into later house. Set back from the L6003, approximately 60m to the east of Option C (Orange).
CH_48	688707 / 724866	Blackhall	Farm	A farm complex depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Located adjacent to the R407, approximately 11m to the east of Option C (Orange).
CH_49	689127 / 724824	Bodenstown	House	A small square roadside (L2010) building with 'L'-shaped range attached another range further south depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Identified as 'Bodenstown Cottage' on later mapping (Ordnance Survey 25", 1888-1913)

Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
				comprising a large building with two smaller rectangular ranges to the west. Located approximately 16m to the south of Option C (Orange).
CH_50	688567 / 724291	Johninstown	Watch Tower	A watch tower depicted on historic mapping and identified as 'in ruins' (Ordnance Survey 25", 1888 - 1913). Located in agricultural fields approximately 70m to the north of Option C (Orange).
CH_52	687422 / 718375	Jigginstown	Field boundaries	Cropmarks corresponding with a field boundary depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) and cultivation marks (see Table 3.6 in Section 3.2.3 above).
CH_53	687650 / 718026	Jigginstown	Field boundaries	A cropmark corresponding with a field boundary depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) and cultivation marks, approximately 40m to the east of Option C (Orange) (see Table 3.6 in Section 3.2.3 above).
CH_54	688148 / 717337	Rathasker	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) (see Table 3.6 in Section 3.2.3 above).
CH_55	688073 / 716071	Killashee	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 13m to the east of Option C (Orange) (see Table 3.3 in Section 3.1.3 above).
CH_56	687962 / 715565	Oldtown	Farm	A farm depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 25m to the west of Option C (Orange) (see Table 3.3 in Section 3.1.3 above).
CH_57	687884 / 714478	Mylerstown	House	A single storey cottage depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 14m to the east of Option B (Green) (see Table 3.3 in Section 3.1.3 above).
CH_58	687418 / 713423	Stephenstown South	House	A cottage depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) located on the roadside, approximately 20m to the west of Option C (Orange) (see Table 3.3 in Section 3.1.3 above).
CH_59	687356 / 713137	Stephenstown South	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 23m to the west of Option C (Orange) (see Table 3.3 in Section 3.1.3 above).

### Previous Excavations

A review of Excavations Bulletin and TII's Archaeological Excavation Reports identified the following archaeological excavations in the Option C (Orange) study area.

- Archaeological investigations in advance of the development of a golf course in Ladycastle Lower identified medieval deposits including structures, metallated surfaces, a substantial ditch, and a medieval lime kiln (Licence numbers: 02E1782<sup>35</sup>, 02E1513<sup>36</sup>, 03E0043<sup>37</sup>, and 02E1781<sup>38</sup>);
- Archaeological testing undertaken in advance of the M7 motorway (Licence number: E004777) in Osberstown, Castlesize, Sallins, Waterstown, Barrettstown, and Bodenstown identified a number of sites of archaeological potential which were subsequently excavated;<sup>39</sup>
- Archaeological excavations undertaken as part of investigations at Jigginstown Castle (Licence number: 02E1603) identified evidence of post-medieval construction debris and material;<sup>40</sup> and
- Archaeological testing for a business park in Jigginstown (Licence number: 02E0672) identified a single flint flake.<sup>41</sup>

A further six archaeological excavations were also identified (under Licence numbers: 99E0027, 02E1654, 04E0073, 02E1751, 03E0555, and 04E1338); however, these did not identify any archaeological remains or deposits of archaeological significance.

A total of two casual finds were also identified within the study area for Option C (Orange), and these comprise finds (1935:544-8 R.I.A.) associated with a cemetery of pit burials (KD019-017; Recorded Monument) in Ploopluck, and 'various archaeological finds' (E 412:1) in Crinstown.

## 3.4 Option D (Blue)

### 3.4.1 Archaeology

Archaeological constraints identified within the study area for Option D (Blue) (see Annex A and Figure B.1.1 in Appendix B.1) comprise:

- One National Monument and three sites with Preservation Orders placed on them;
- Three Recorded Monuments; and
- 18 sites recorded on the SMR.

#### National Monuments & Preservation Orders

There is one National Monument (AY\_39; also a Protected Structure, AH\_16) and three sites with Preservation Orders placed on them (AY\_40, AY\_42, and AY\_43) located approximately 40m to the west of Option D (Blue) (see Figure B.1.1 in Appendix B.1). These, along with two further sites with Preservation Orders placed on them (AY\_38 and AY\_44; also a Protected Structure, AH\_17), form the Jigginstown Castle complex (see Section 3.1.1 above).

<sup>35</sup> <https://excavations.ie/report/2003/Kildare/0009985/> [Accessed 05.11.21].

<sup>36</sup> <https://excavations.ie/report/2002/Kildare/0008267/> [Accessed 05.11.21].

<sup>37</sup> <https://excavations.ie/report/2003/Kildare/0009986/> [Accessed 05.11.21].

<sup>38</sup> <https://excavations.ie/report/2003/Kildare/0009984/> [Accessed 05.11.21].

<sup>39</sup> <https://excavations.ie/report/2017/Kildare/0026981/> [Accessed 05.11.21].

<sup>40</sup> <https://excavations.ie/report/2002/Kildare/0008231/> [Accessed 05.11.21].

<sup>41</sup> <https://excavations.ie/report/2002/Kildare/0008229/> [Accessed 05.11.21].



### Register of Historic Monuments

Five sites on the RHM have been identified (AY\_38, AY\_39, AY\_42, AY\_43, and AY\_44) along the route of Option D (Blue), these form part of the Jigginstown Castle complex and, to avoid double counting constraints, have been included above under their more significant designations (see above).

### Recorded Monuments

Three Recorded Monuments are located within the study area for Option D (Blue) (see Figure B.1.1 in Appendix B.1). These comprise:

- The site of a medieval parish church (AY\_09), located approximately 46m to the south of Option D (Blue), in the townland of Moyglare. The church, surrounded by an enclosed graveyard (AY\_08), continued in use until the 1870s when it was replaced with the current Gothic-style Saint Paul's Church of Ireland Church (AH\_03; see Section 3.4.2 below). No evidence of the medieval church is visible.
- Archaeological investigations in advance of construction of the M4 motorway in Crinstown identified a site of medieval domestic activity (AY\_11). The site included a cobbled area and two large ditches, with pottery sherds dating from the 13th to the 16th centuries.<sup>42</sup> While this site provides evidence of medieval activity in this location, given this site has been removed and the area developed it is no longer a constraint.
- The site of a castle (AY\_28) of unknown date in Castlesize, approximately 76m to the west of Option D (Blue). While the site of that castle is depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), no trace of the castle remains extant.

### Sites on the Sites and Monuments Record

A total of 18 sites recorded on the SMR have been identified within the study area for Option D (Blue). These comprise the locations of cropmarks and evidence of medieval religious and domestic activity. These are included in Table 3.10 and are shown on Figure B.1.1 (Appendix B.1).

A further two sites on the SMR have not been included in Table 3.10 as these comprise the site of a midden (AY\_41) identified at Jigginstown Castle complex, and a redundant record (AY\_45). While AY\_41 provides an indication of possible activity in this location, given this site has been removed it is no longer a constraint.

Table 3.10: Sites recorded on the SMR within the study area for Option D (Blue)

Reference Number	SMR Reference	Description	Townland	Location (Easting / Northing)
AY_08	ME049A002001	A sub-rectangular graveyard surrounding the site of a medieval parish church (AY_09). The graveyard is depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) and is defined by a low rubblestone wall. Saint Paul's Church of Ireland Church (AH_03; see Section 3.4.2 below) is located within the graveyard.	Moyglare	692690 / 739763
AY_10	KD005-036	A large circular cropmark interpreted as an enclosure (see Table 3.4 in Section 3.2.1 above).	Laraghbryan East	692023 / 737926
AY_15	KD010-066	A pair of circular cropmarks, measuring approximately 8 - 9m in diameter, located on opposite sides of the R406 approximately	Toolestown	693401 / 734497

<sup>42</sup> <http://excavations.ie/report/1987/Kildare/0000733/> [Accessed 07.11.21].

Reference Number	SMR Reference	Description	Townland	Location (Easting / Northing)
AY_16	KD010-067	26m to the east (AY_15) and 55m to the west (AY_16) of Option D (Blue) respectively	Toolestown	693296 / 734447
AY_18	KD010-070	A circular cropmark measuring approximately 8m in diameter in Windgates (AY_18), approximately 54m to the east of Option D (Blue). Interpreted as a ring ditch, this feature is located in an arable field with other, possibly associated, features identified from aerial imagery including a circular enclosure (KD010-071) to the south-east and linear features running north-south.	Windgates	693081 / 733087
AY_19	KD010-042	An enclosure comprising two circular concentric ditches, and measuring approximately 40m in diameter, is located in Barberstown Upper, approximately 69m to the west of Option D (Blue). While of unknown date, this bivalate cropmark is located in proximity to a second, more ephemeral, example which has been interpreted as the remains of a possible barrow.	Barberstown Upper	692654 / 731590
AY_20	KD010-022001	A roughly coursed rubble bawn wall (defensive wall), associated with Baberstown Castle (AH_09; see Section 3.4.2 below) is located approximately 100m to the south of Option D (Blue).	Barberstown	692674 / 731143
AY_21	KD010-057	A pair of barrows, which form part of a cluster, in Baberstown (including AY_21 and AY_22) are located approximately 90m to the south of Option D (Blue). Visible on aerial imagery within arable fields, one of the barrows (AY_21) is bisected by a field boundary.	Barberstown	692558 / 731133
AY_22	KD010-058		Barberstown	692523 / 731116
AY_23	KD014-096	A ring ditch comprising a circular cropmark, measuring approximately 10m in diameter, identified on aerial imagery in Longtown (AY_23), approximately 98m to the south-east of Option D (Blue).	Longtown	690299 / 730172
AY_32	KD014-062	A cluster of possible barrows (AY_32, AY_33, and AY_34, approximately 55m to the north, 40m to the south, and 94m to the south of Option D (Blue), respectively) (see Table 3.7 in Section 3.3.1 above).	Castlesize	688409 / 724218
AY_33	KD014-073		Castlesize	688644 / 724200
AY_34	KD014-076		Castlesize	688590 / 724128
AY_35	KD014-074	A large circular approximately 40m to the south-east of Option D (Blue), close to a group of barrows (AY_32 – 34) (see Table 3.7 in Section 3.3.1 above).	Castlesize	688419 / 724116
AY_36	KD019-081	A cropmark, interpreted as a ring ditch, approximately 80m to the west of Option D (Blue) (see Table 3.1 in Section 3.1.1 above).	Osberstown	687886 / 722860
AY_46	KD024-050004	A group of small rectangular cropmarks, interpreted as enclosures, within approximately 6m of Option D (Blue) (see Table 3.1 in Section 3.1.1 above).	Dunstown	687302 / 712740
AY_47	KD024-050005		Dunstown	687328 / 712725
AY_48	KD024-050006		Dunstown	687335 / 712719

### Archaeological Potential

Option D (Blue) crosses the Rye Water, River Lyreen and the River Liffey, as well as a number of minor watercourses with the potential for votive (religious) offerings to be present. The underlying geology is largely limestone, with superficial deposits of till, gravel and alluvium, which has the potential to preserve previously unknown archaeological monuments and remains. Areas of outcropping bedrock (visible exposures of solid rock) have also been noted along the route of Option D (Blue) and the potential for previously unknown archaeological monuments and remains in these areas would be limited.

## **3.4.2 Architectural Heritage**

Architectural heritage constraints within the study area for Option D (Blue) comprise:

- Six Protected Structures (see Figure B.1.2 in Appendix B.1); and
- Seven GDLs (see Figure B.1.3 in Appendix B.1).

No ACAs or structures included on the NIAH have been identified within the study area for Option D (Blue).

### Record of Protected Structures

Six Protected Structures have been identified within the study area for Option D (Blue), comprising post-medieval churches and dwellings, including estate buildings and a castle. Protected Structures identified within the study area for Option D (Blue) are shown on Figure B.1.2 (Appendix B.1).

Saint Paul's Church of Ireland Church (AH\_03; also assessed by the NIAH to be of Regional importance) is located approximately 26m to the south of Option D (Blue) and comprises a Gothic-style structure set within a sub-rectangular churchyard (AY\_08). Built in the late 19th century the church includes a three-stage tower with ashlar limestone spire, is a typical example of contemporary church design. The church overlooks Moygale Road to the north, and agricultural fields to the south, with views outward largely uninterrupted.

Greygates (AH\_07) is located approximately 18m to the west of Option D (Blue) and comprises a house depicted on historic mapping (Ordnance Survey 25", 1888 - 1913). The building is a modest one and a half storey, five bay house, positioned perpendicular to the R406, of coursed rubble stone construction.

Barberstown House (AH\_08), on the junction between the R406 and R403, approximately 40m to the north of Option D (Blue), comprises a five bay, two-storey double pile farmhouse to the south of a number of stone ranges. This square-plan house appears to have replaced an earlier building, 'Barberstown Cottage' depicted on historic mapping (Ordnance Survey 6", 1837 - 1842), in the late 19th or early 20th century (Ordnance Survey 25", 1888 - 1913).

Originally the site of a 13th century structure, Barberstown Castle (AH\_09), approximately 87m to the south of Option D (Blue) comprises a medieval tower house with an associated roughly coursed rubble bawn (AY\_20; see above). A tower house is a multi-storey, fortified hall house and a bawn is a defensive wall. The tower house comprises a coursed rubble masonry structure with two square corner towers with battered bases. The castle, now a hotel, was extended and modified during the post-medieval period, with later buildings dating to the 17th and 18th centuries, as well as more recent renovations.

The gate lodge and entrance (AH\_14) to the east of Castlesize demesne (DL\_18) is located approximately 25m to the west of Option D (Blue). The lodge comprises a single storey building, on the driveway to the main house (RPS B14-13). The lodge is set behind a high stone boundary wall to the north of the entrance gates (off the R407), surrounded by mature trees and established vegetation.

Bluebell Farm House (AH\_18) is located approximately 35m to the west of Option D (Blue) and is described in Section 3.1.2.

#### Architectural Conservation Areas

There are no ACAs located within the study area for Option D (Blue). The nearest ACA to the option is Naas ACA, located approximately 700m to the east Option D (Blue).

#### National Inventory of Architectural Heritage

One structure included on the NIAH has been identified within the study area for Option D (Blue). Saint Paul's Church of Ireland Church (AH\_03) is also a Protected Structure and, to avoid double counting constraints, has been included above under Protected Structures.

#### Survey of Gardens and Designed Landscapes

A total of seven GDLs have been identified within the study area for Option D (Blue). Of these six were recorded by the Survey of Historic Gardens and Designed Landscapes and one has been identified from historic mapping (Ordnance Survey 6", 1837 – 1842). Information on the GDLs is presented in Table 3.11 Table and are shown on Figure B.1.3 (Appendix B.1).

Table 3.11: GDLs identified within the study area for Option D (Blue)

Reference Number	Name	Description	Townland	NIAH Reference
DL_02	Jeninstown House	Demesne identified from historic mapping (Ordnance Survey 6", 1837 – 1842). The principal house remains extant (CH_02), and the demesne includes a roughcast boundary wall, gate piers, and driveway leading to the house. Mature trees and a ditch mark the boundary along the R156.	Jeninstown	N/A
DL_09	Dowdstown House	Garden and designed landscape associated with Dowdstown House. The area within the boundary of this demesne has largely been redeveloped.	Dowdstown	NIAH 1911
DL_16	Blackhall	The GDL associated with Blackhall. The principal building and agricultural ranges remain extant, along with the layout of the gardens and woodland, including a belt of trees along boundary with the R407.	Blackhall	NIAH 1890
DL_17	Millicent House	The GDL to Millicent House. The extensive riverside demesne lands surrounding the principal house (RPS B14-26) include extant estate features such as lodges (including AH_15), a walled garden, drives, and areas of woodland and parkland depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913). Sections of rubble stone wall delimit the demesne and line the road from the entrance to Millicent Bridge.	Millicent Demesne	NIAH 1889
DL_18	Castlesize	The GDL associated with Castlesize which largely retains the buildings and layout as depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). The entrance opposite the junction between the R407 and Castlesize Green includes entrance walls, gate piers, and cast-iron gates. The boundary along the R407 comprises a rubblestone wall with alternate vertical and horizontal copes.	Castlesize	NIAH 1893
DL_19	Osberstown Hill	The GDL to Osberstown Hill house. The principal building remains extant; however, the Dublin-Cork (and others) railway line has replaced the northern boundary and the Sallins Bypass has removed a section of the eastern corner.	Osberstown	NIAH 1887
DL_20	Killashee House	The GDL to Killashee House. Largely developed include Killashee National School, and the majority of demesne features have been removed. The R448 is located within the western boundary of the demesne. Extant boundary features include established hedgerows and a ditch, and modern post and rail fencing. A section of roughly coursed rubble stone wall is extant to the south of the demesne, along with a later recessed entrance.	Killashee	NIAH 1980

### **3.4.3 Cultural Heritage**

A total of 24 cultural heritage sites identified within the study area for Option D (Blue) from the sources identified in Section 2. These largely comprise extant post-medieval buildings and structures, including stone road bridges, vernacular housing and farm buildings, as well as cropmarks corresponding with post-medieval field systems. Summary information on these cultural heritage sites is presented in Table 3.12Table below and are shown on Figure B.1.4 (Appendix B.1).

Table 3.12: Cultural heritage sites identified within the study area for Option D (Blue)

Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
CH_01	694713 / 746280	Culcommon	Road Bridge	The stone parapet of a road bridge or culvert depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 2m to the east of Option D (Blue) (see Table 3.3 in Section 3.1.3 above).
CH_02	691765 / 745557	Warrenstown	House	'Jenkinstown House' depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) comprising the main house and a long range to north, approximately 65m to the north-west of Option D (Blue) (See Table 3.3 in Section 3.1.3 above).
CH_03	693262 / 745438	Jenkinstown	Public House	A public house depicted on historic mapping (Ordnance Survey 25", 1888-1913) immediately adjacent to the R156, approximately 14m to the south-east of Option D (Blue) (See Table 3.3 in Section 3.1.3 above).
CH_04	691671 / 745333	Jenkinstown	Road Bridge	A stone road bridge that carries the R156 across a small watercourse - depicted on historic mapping as 'Jenkinstown Bridge' (Ordnance Survey 6", 1837 – 1842) (see Table 3.3 in Section 3.1.3 above).
CH_13	692931 / 739788	Moyglare	Police Station	A police station depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) and identified on later mapping as a 'constabulary barracks' (Ordnance Survey 25", 1888 - 1913). Located immediately to the north of Moyglare Road, overlooking the roadway.
CH_18	692330 / 737877	Laraghbryan East	Earthworks	Linear banks and ditches in a field to the north of Kilcock Road, identified from historic aerial photographs (see Table 3.6 in Section 3.2.3 above).
CH_19	691947 / 737649	Laraghbryan East	Bridge	The site of a possible bridge or crossing point over the River Lyreen, approximately 88m to the west of Option D (Blue), depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) (see Table 3.6 in Section 3.2.3 above).
CH_20	692218 / 736772	Newtown	Farm	A farm depicted on historic mapping (Ordnance Survey 6", 1837 – 1842); however, the current layout reflects that depicted on later mapping (Ordnance Survey 25", 1888 - 1913). The farm is located west of Rathcoffey Road, and immediately to the north of the M4 motorway, approximately 47m to the north of Option D (Blue).
CH_29	692955 / 732635	Windgates	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Located to the east of the R406, approximately 35m to the east of Option D (Blue), views are across the carriageway over arable fields. Modern farm buildings are located to the east and south.
CH_33	693077 / 731907	Barberstown Lower	Field boundaries	Linear and curvilinear cropmarks identified from aerial imagery. Some of these features correspond with historic field boundaries depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). Located immediately adjacent to the R406, approximately 20m to the east of Option D (Blue).
CH_34	692707 / 731744	Barberstown Upper	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913). Located to the west of the R406, approximately 20m to the west of Option D (Blue), views are across the carriageway towards arable fields. A gravel pit is located to the north.
CH_35	693259 / 731148	Barberstown	Field boundaries	Linear cropmarks identified from aerial imagery that correspond to field boundaries on historic mapping (Ordnance Survey 6", 1837 – 1842). Located approximately 42m to the south-east of Option D (Blue), immediately adjacent to the junction between the R406 and R403.



Reference Number	Location (Easting / Northing)	Townland	Site Type	Description
CH_36	692346 / 730958	Barberstown; Staffan; Bawnoges	Field boundaries	Linear cropmarks identified from aerial imagery including some which correspond with field boundaries depicted on historic mapping (Ordnance Survey 6", 1837 – 1842). However, these features are located near a cluster of SMR features which may comprise a barrow cemetery (including AY_21 and AY_22). In a field immediately to the south of the R403.
CH_38	688543 / 728782	Richardstown	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913). The house is set away from the R403, approximately 67m to the north-west of Option D (Blue), in agricultural land, with a clump of established trees to the immediate south-east.
CH_40	688493 / 727099	Blackhall	Field System	A series of linear and curvilinear cropmarks identified on aerial imagery to the south of the River Liffey. Interpreted as possible enclosures or a field system. No corresponding features were identified on historic mapping.
CH_45	688212 / 726113	Blackall	Lodge	A lodge depicted on historic mapping (Ordnance Survey 6", 1837 – 1842; Ordnance Survey 25", 1888 - 1913). Located on the R407 at the entrance to the Blackhall GDL (DL_16), approximately 16m to the east of Option D (Blue), adjacent to a treelined driveway.
CH_48	688707 / 724866	Blackhall	Farm	A farm complex depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 11m to the east of Option D (Blue) (see Table 3.9 in Section 3.3.3 above).
CH_50	688567 / 724291	Johninstown	Watch Tower	A watch tower depicted on historic mapping (Ordnance Survey 25", 1888 - 1913), approximately 70m to the north of Option D (Blue) (see Table 3.9 in Section 3.3.3 above).
CH_51	688232 / 719268	Jigginstown	Aqueduct	'Aqueduct' identified on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 22m to the north-east of Option D (Blue) (see Table 3.3 in Section 3.1.3 above).
CH_55	688073 / 716071	Killashee	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 13m to the east of Option D (Blue) (see Table 3.3 in Section 3.1.3 above).
CH_56	687962 / 715565	Oldtown	Farm	A farm depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 25m to the west of Option D (Blue) (see Table 3.3 in Section 3.1.3 above).
CH_57	687884 / 714478	Mylerstown	House	A single storey cottage depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 14m to the east of Option D (Blue) (see Table 3.3 in Section 3.1.3 above).
CH_58	687418 / 713423	Stephenstown South	House	A cottage depicted on historic mapping (Ordnance Survey 6", 1837 – 1842) located on the roadside, approximately 20m to the west of Option D (Blue) (see Table 3.3 in Section 3.1.3 above).
CH_59	687356 / 713137	Stephenstown South	House	A house depicted on historic mapping (Ordnance Survey 6", 1837 – 1842), approximately 23m to the west of Option D (Blue) (see Table 3.3 in Section 3.1.3 above).

### Previous Excavations

The Excavations Bulletin and TII's Archaeological Excavation Reports were consulted to identify archaeological excavations that had been undertaken within the study area for Option D (Blue).

Archaeological testing undertaken in advance of the M7 motorway (Licence number: E004777) in Osberstown, Castlesize, Sallins, Waterstown, Barrettstown, and Bodenstown identified a number of sites of archaeological potential which were subsequently excavated.<sup>43</sup>

A further nine archaeological excavations were also identified (under Licence numbers: 15E0151, 06E0205, 05E0988, 03E1219, 06E0045 ext., 02E0419, 05E1334, 05E1334 ext., and 14E0452); however, these did not identify any archaeological remains or deposits of archaeological significance.

Five casual finds were also identified within the study area for Option D (Blue), and these comprise bronze pins and a fibula (1984: 5,6, and 1969:75) in Jigginstown and Naas West, artefacts (1935:544-8 R.I.A.) associated with a cemetery of pit burials (KD019-017; Recorded Monument) in Ploopluck, 'various archaeological finds' (E 412:1) in Crinstown, and a glazed medieval pot sheard (1979:13) in Jigginstown.

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<sup>43</sup> <https://excavations.ie/report/2017/Kildare/0026981/> [Accessed 05 November 2021].

## 4. References

### Aerial Photographs

Cambridge University Collection of Aerial Photography (CUCAP): <https://www.cambridgeairphotos.com/>

CUCAP Number	Date	Subject
APE008	1966	Earthworks. Maynooth, Kildare, Ireland
BDU041	1970	Linear earthwork. Kilcock, 'The Pale', Kildare, Ireland

### Historic Maps

The Down Survey of Ireland, 1656-1658, <http://downsurvey.tcd.ie/index.html>.

Noble and Keenan's map of Kildare, 1752, <https://www.logainm.ie/Eolas/Data/Brainse/logainm.ie-map-j-noble-and-j-keenan-1752-grand-jury-kildare-south.jpg> and <https://www.logainm.ie/Eolas/Data/Brainse/logainm.ie-map-j-noble-and-j-keenan-1752-grand-jury-kildare-north.jpg>.

Larkin's map of Meath, 1812, <https://www.logainm.ie/Eolas/Data/Brainse/logainm.ie-map-william-larkin-1812-grand-jury-meath-sheet-06.jpg>

Ordnance Survey, 6" to 1 mile, 1837 – 1842, <https://geohive.maps.arcgis.com/apps/webappviewer/index.html?id=9def898f708b47f19a8d8b7088a100c4>

Ordnance Survey, 25" to 1 mile, 1888-1913, <https://geohive.maps.arcgis.com/apps/webappviewer/index.html?id=9def898f708b47f19a8d8b7088a100c4>

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## **Annex A. Inventory of Archaeology, Architectural Heritage and Cultural Heritage Constraints**

Table A1: Inventory of Archaeological Constraints

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
AY_01	MEO49-014001	N/A	Calgath	Meath	Ritual site - holy well	689223 / 742511	<p>Situated on a rise of a gentle S-facing slope at the centre of the mound (ME049-014----). The well is known as St Bride's Well and it was revered in the 19th century when it was described as having a diameter of 12 feet (c. 3.75m) (Cogan 1862-70, 2, 361). It was a small natural spring (diam. c. 1m) at the base of the stump of an ash tree in 1969 (SMR file) but is has been conserved in 2000 and is now a stone-lined well (diam. 0.85m; max. D 1.75m) with water approached by a path and steps from the N while the mound is less prominent. The well is surrounded by a paved path (Wth c. 1.5m) and within an enclosure (diam c. 5m) defined by a hedge and a picket fence, and there are two young trees outside the enclosure, one with rags. (French 2012, 33-4)</p> <p>Depicted on historic mapping as a large circular 'Mound' with 'Brides Well' located off centre towards the eastern limit of the mound. Later mapping depicts the well more centrally linked to a watercourse to the west.</p> <p>The mound is barely perceptible and is surrounded by a modern post and rail fence and low hedges, within a pasture field, west of the R125.</p> <p>The well is described as one of the hot wells in Meath and is said to have sprang up when St Brigid rested in the location that cured deafness and ear complaints. The well was described as 'situated on the side of a circular mound or hill, and an aged ash spreads its branches over it; the diameter of this well is twelve feet four inches'.</p> <p>A tree was located on the top of the low mound (1960s); however, this has since been removed.</p>	19th century	<p>Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p> <p>Google StreetView 2011 [07 November 2021]</p> <p>'St. Brigid's Well', Ireland's Holy Wells County-by-County. Available online: 2021, <a href="https://ihwcbc.omeka.net/items/show/416">https://ihwcbc.omeka.net/items/show/416</a> [Accessed 12.11.2021]</p> <p><a href="https://digital.ucd.ie/view/duchas:49398">https://digital.ucd.ie/view/duchas:49398</a> [07 November 2021]</p>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
AY_02	ME049-014	Recorded Monument	Calgath	Meath	Mound	689227 / 742510	<p>Marked on the 1837 ed. of the OS 6-inch map as a small feature and described in gothic lettering as a 'Mound'. It was described as a circular mound (diam. 24m E-W, H 1.6m) truncated by ditch at S and with the holy well (ME049-014001-) at the centre (Moore 1987, 34), but the well has been conserved since 1985, and the mound is no longer prominent. Depicted on historic mapping as a large circular 'Mound' with 'Brides Well' located off centre towards the eastern limit of the mound. Later mapping depicts the well more centrally linked to a watercourse to the west.</p> <p>The mound is barely perceptible and is surrounded by a modern post and rail fence and low hedges, within a pasture field, west of the R125.</p> <p>A tree was located on the top of the low mound (1960s); however, this has since been removed.</p>	Unknown	<p>Record of Monuments and Places - County Meath (1996)</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p> <p>Google StreetView 2011 [07 November 2021]</p> <p><a href="https://digital.ucd.ie/view/duchas:49398">https://digital.ucd.ie/view/duchas:49398</a> [07 November 2021]</p>
AY_03	ME049-018	Recorded Monument	Calgath	Meath	Field system	689241 / 741855	<p>Located on a gentle S-facing slope. Earthworks of relict field banks and drains covering an area of about 12 acres (c. 5 ha) are visible on aerial photographs (GSIAP: N 605, 606) and some later series. The banks (Wth c. 2m; H c. 0.3m) and ditches (Wth c. 1-2m; D c. 0.2m) create some irregular fields (dims c. 60m x c. 30m to c. 100m x c. 70m) which are covered in cultivation ridges confined to individual fields. There are some wide linear spaces (Wth c. 5-10m) between fields that might be roadways. The defining features are best preserved at the SW angle of the area and some modern houses impinge on it. Archaeological testing (O4E0764) by S. Linnane at the S edge of the area produced no related material (excavations.ie 2004:1193).</p> <p>A field system is visible on digital globe aerial imagery as the earthwork banks and ditches, the remains of ridge and furrow, and linear features that may evidence possible tracks or roadways. The fields are irregular in shape and extend into the large field to the north.</p>	Unknown	<p>Record of Monuments and Places - County Meath (1996)</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p> <p>Google StreetView 2011 [07 November 2021]</p>



ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							The field pattern does not correspond with that depicted on historic mapping.		
AY_04	MEO49-021	Recorded Monument; Protected Structure	Rodanstown	Meath	Church	690574 / 741328	<p>Situated on the W side of a small N-S fold in a fairly level landscape. At its suppression in 1540 the tithes of Kilclone and Balradan were amongst the possessions of St Peter's Augustinian abbey in Newtown Trim (ME036-049003-) (White 1940, 297). Ussher (1622) describes the church at Ballruddan as repaired although the chancel was ruined (Erlington 1847-64, 1, lxxix). According to the Dopping (1682-5) and Royal (1693) visitations the parish church of of St Rodan at Balroddan or Rodanstown was in good repair but there was no chancel. A font is listed and the graveyard was enclosed (Ellison 1972, 5). The saint could be St Ruadhán of Lorrha (TN004-010----), but there is no known connection. Lewis (1837, 2, 480) describes the church as an 'ancient plain edifice', but the present structure is likely to be 18th century in date.</p> <p>A church and oval graveyard is depicted on historic mapping on the bend immediately adjacent to the bend in the road through Rodanstown. The church is depicted as a rectangular building towards the centre of the graveyard, orientated north-west to south-east. The church and graveyard is shown surrounded by trees. Later mapping shows the church orientated west-east with a curved apse to the east. The church is identified as 'disused'.</p> <p>The current ruinous church is located towards the centre of the oval graveyard on the bend in the road. No remains of the medieval church are perceptible and the current structure appears to be a later.</p>	Medieval	Record of Monuments and Places - County Meath (1996) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2019 [07 November 2021]
AY_05	MEO49-021001	N/A	Rodanstown	Meath	Graveyard	690573 / 741320	<p>Situated on the W side of a small N-S fold in a level landscape. The site of the medieval parish church of Rodanstown (ME049-021----) is within an oval graveyard (dims c. 55m N-S; c. 45m E-W) defined by</p>	Medieval	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							<p>an earthen bank SE-W-NW and by a masonry wall NW-E-SE where it is skirted by a public road. The headstones date largely from c. 1750 to c. 1910 with some newer headstones from the 1970s. The font from this graveyard is now at Milltown (ME017-036----) near Kells.</p> <p>An oval graveyard is depicted on historic mapping, surrounded by trees. Later mapping continues to show the graveyard with the same extent.</p> <p>The boundary is defined by an earthen bank (possibly with stone facing in areas) and roughcast stone wall. The memorials and ruinous church within the graveyard date from the mid-18th century onwards.</p>		<p>Ordnance Survey 25", 1888-1913</p> <p>Google StreetView 2019 [07 November 2021]</p>
AY_06	ME049-021002	N/A	Rodanstown	Meath	Font	690580 / 741315	<p>The font Rodanstown graveyard (ME049-021001-) mentioned by Cogan (1862-70, 2, 359) is now at Milltown (ME017-036----) near Kells. It is octagonal (ext. dim. 0.6m; H 0.5m) with chamfered under-panels and has a circular, flat-bottomed basin (int. diam. 0.46m; D 0.15m). The font stands on an octagonal base with a moulding at the top (H 0.28m) (Roe 1968, 113).</p>	Post-medieval	Archaeological Survey of Ireland SMR
AY_07	KD005-024	N/A	Boycetown	Kildare	Excavation - miscellaneous	687822 / 740465	<p>Archaeological monitoring (Licence no. 03E1554) was carried out in association with a proposed development of a warehousing facility and ancillary offices, along with associated services, infrastructure, storage and landscaping in an area measuring 13,937m<sup>2</sup>. Two small pits were observed in the northernmost field at the site. No diagnostic material was recovered from the northern pit. A small amount of burnt-bone fragments were recovered from the other. These have been retained for analysis. Nothing further of archaeological significance was recovered.</p>	Unknown	<p>Archaeological Survey of Ireland SMR</p> <p><a href="https://excavations.ie/report/1970/Kildare/000029/">https://excavations.ie/report/1970/Kildare/000029/</a> [04 November 2021]</p>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
AY_08	ME049A002001	N/A	Moyglare	Meath	Graveyard	692690 / 739763	<p>Located on a level landscape with the W-E Rye Water, which forms the boundary with Co. Kildare, c. 200m to the S. The site of the parish church of Moyglare (ME049A-002----) is within a subrectangular graveyard (dims c. 65m E-W; c. 40-60m N-S) defined by masonry walls. According to the Dopping (1682-5) and Royal (1693) visitations the graveyard was 'well fenced' at that time (Ellison 1972, 4).</p> <p>A sub-rectangular graveyard is depicted on historic mapping.</p> <p>The extent of the graveyard remains unchanged. The boundary is defined by a low rubblestone wall, with vertical copes.</p>	Post-medieval	<p>Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p> <p>Google StreetView 2019 [07 November 2021]</p>
AY_09	ME049A002	Recorded Monument	Moyglare	Meath	Church	692690 / 739742	<p>Located on a level landscape with the W-E Rye Water, which forms the boundary with Co. Kildare, c. 200m to the S. A church at Mynclare (Moyglare) is listed in the ecclesiastical taxation (1302-06) of Pope Nicholas IV (Cal. doc. Ire., 5, 255). Ussher (1622) describes the church as in good repair but the chancel as ruined (Erlington 1847-64, 1, lxxvi). According to the Dopping (1682-5) and Royal (1693) visitations the parish church of Moyglare had been repaired, but the chancel was in ruins since 1641. The church was roofed with slates, the floor was clay and there was glass in the windows. In addition the graveyard was described as 'well fenced' (Ellison 1972, 4). This church continued in use until c. 1870 when St. Paul's church, a four bay Church of Ireland church with an attached spire, was built. This is now a private dwelling within a subrectangular graveyard (dims c. 65m E-W; c. 40-60m N-S) defined by masonry walls. There is no evidence of the medieval structure.</p> <p>No evidence of the medieval church is perceptible. The church depicted on historic mapping reflects the current post-medieval structure.</p>	Post-medieval	<p>Record of Monuments and Places - County Meath (1996)</p> <p>Google StreetView 2019 [07 November 2021]</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
AY_10	KD005-036	N/A	Laraghbryan East	Kildare	Enclosure	692023 / 737926	<p>Cropmark of circular-shaped enclosure (approx. diam. 44m) visible on Google earth aerial imagery.</p> <p>An ephemeral circular cropmark visible on Google aerial imagery in an arable field to the north of the R148. A number of similar cropmarks are perceptible in fields further north which may be associated with the site.</p> <p>No corresponding earthworks are perceptible on aerial photographs.</p> <p>Possible the location of 'Bryan's house site' ('lauragh' meaning the site of something, usually a building).</p>	Unknown	<p>Archaeological Survey of Ireland SMR</p> <p><a href="https://www.cambridgeairphotos.com/location/ape008/">https://www.cambridgeairphotos.com/location/ape008/</a> [04 November 2021]</p> <p>Joyce, P., W., (1887), The Origin and Historic of Irish Names of Places, Volume 1 (fifth edition). Dublin: M. H. Gill and Son.</p>
AY_11	KD005-018	Recorded Monument	Crinstown	Kildare	Habitation site	691781 / 736833	<p>In 1987, an archaeological excavation was conducted in conjunction with the construction of the Kilcock-Leixlip motorway bypass. According to Keeley (1991, 168), 'The site (was) identified from an aerial photograph ... Evidence of medieval occupation was uncovered ... represented by a cobbled area (dims. L c. 120m; Wth c. 120m). A habitation layer lay directly on the cobbles and consisted of a brown humic material with inclusions of fragmentary iron objects and a large amount of ceramic sherds ... of both cooking and glazed wares with a dating range from the 13th-16th century.' Additional information is available on <a href="http://www.excavations.ie">www.excavations.ie</a> (search by townland), 'Two large ditches were also revealed. Ditch 'H' lay to the west of the cobbling and was 4m (max.) wide by 0.95m deep at subsoil level. Finds from this ditch reflect a similar date to those found associated with the cobbling. Ditch 'I' lay just east of the cobbling and was 2.65m (max.) wide by 0.85m deep at subsoil level. Five modern drains were also uncovered.'</p>	Medieval	<p>Record of Monuments and Places - County Kildare (1995)</p> <p><a href="http://excavations.ie/report/1987/Kildare/000733/">http://excavations.ie/report/1987/Kildare/000733/</a> [04 November 2021]</p>
AY_12	-	-	-	-	-	-	Number not used	-	-

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
AY_13	KD010-001001	Recorded Monument; Register of Historic Monuments	Ballybrack (Balraheen Ed), Ballyloughan, Clonduff, Clonfert North, Clonfert South, Graiguepottle	Kildare	Linear earthwork	686721 / 735896	<p>The area which would later be called 'The English Pale', from the Latin 'palus', a stake, and also possibly from the name of an earthen fortification at Calais in France (Lydon 1972, 261), originated in the 14th century when Norman settlers began fortifying their lands in counties Dublin, Kildare, Louth and Meath against attack by the native Irish. By 1435, ongoing attacks, probably primarily aimed at cattle theft (O'Riordáin 1971, 15), prompted the concept of an additional, linear defensive feature, the boundaries of which were defined in a 1488 Act of Parliament as extending, 'from Merrion inclusive to the waters of the Dodder, by the new ditch to Saggard, Rathcoole, Kilheel (Kilteel), Rathmore and Ballymore (Eustace), thence to the county of Kildare into Ballycutlan (Coghlanstown), Harristown and Naas, and so thence to Clane, Kilboyne, and Kilcock' (Mc Neill 1950, 250). In 1494, Parliament directed that, 'every inhabitant, earth tiller and occupier in said marches (borderlands), do build and make a double ditch six feet high above ground at one side or part which meareth next unto Irishmen between this and next Lamma (August 1st.), the said ditches to be kept up and repaired as long as they shall occupy said land.' However, Ellis (Ellis S. G. 'The emergence of the English Pale in Ireland' in Irish Historical Studies) points to a statute in Poyning's parliament in 1495 for 'ditches to be made aboute the Inglishe pale' as the first application of the term to Ireland. The Pale contracted eastwards in subsequent years and it is not certain if its original extent was ever completely ditched. By the seventeenth century, The Pale had ceased to have any real political or defensive significance.</p> <p>Only a few short sections have been positively identified in Co Kildare; in Kilteel Upper/Cupidstown near Rathmore (KD020-008-----), in Bishopsland just SW of Ballymore Eustace (KD029-039----), at</p>	14th century	<p>Record of Monuments and Places - County Kildare (1995)                      Kildare County Development Plan (2017 - 2023)                      Ordnance Survey 25", 1888-1913  <a href="https://www.cambridgeairphotos.com/location/bdu041/">https://www.cambridgeairphotos.com/location/bdu041/</a> [04 November 2021]</p>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							<p>Castlebrown or Clongowes (KD010-021----/KD014-008----) and finally, the best preserved, semi-continuous portion which runs for c. 3365m through the townlands of Ballybrack, Ballyloughan, Clonduff, Clonfert South and Graiguepottle, c. 5km N of Clongowes (KD010-001----). There it is traceable from its E end in Clonfert South as a narrow (Wth 3.5m) metalled laneway between two probably recut fosses, running W (L c. 420m), and then veering NW (L c. 365m). [Archaeological test-trenching at one location along this section revealed possible medieval habitation evidence: KD010-001008-.] It then changes direction slightly to head NNW (L c. 660m) as a disused laneway (Wth 4.8m), slightly raised above surrounding field level, and running between two wide, deep fosses (Wth 3.8m; D 2.9m), forming the townland boundary between Clonfert South and Graiguepottle. It then turns sharply to head W (L c. 1085m) mainly as a functioning laneway (Wth 3.5m) between two deep fosses through Clonduff to a point where it appears to divide: one short section (L c. 155m) apparently continues W into Ballyloughan as a metalled laneway (Wth 3.5m) flanked by drains on either side, while the main section turns sharply S (L c. 680m) and continues as a fosse (Wth 2.5m; D 1m), the corresponding bank of which (noted in 1976, SMR file) has been levelled. Along this latter section it forms the townland boundary between Ballyloughan and Graiguepottle. Visible on several aerial photographs (CUCAP AVM 27-8, AHK 4, BDU 41). The monument is included on the Register of Historic Monuments. (Bradley 2011, 51-67) Depicted on historic mapping as a ditch or narrow trackway and identified as 'The Pale'. Aerial photographs show an ephemeral ditch feature aligned north-south running adjacent to the R407, alongside the current field boundary.</p>		

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
AY_14	KD010-006	Recorded Monument	Donaghstown	Kildare	Enclosure	691919 / 735233	<p>Visible on aerial photographs (CUCAP ATA 29, BDU 42, 1967) as a long, narrow, slightly raised rectangular area (est. dims. L c. 80m NW-SE; Wth c. 20m NE-SW) with a rounded western end, truncated N-S to W of centre by a later road, subsequently disused and replaced by a realigned road to the W. The ground surface is uneven in this area, but the site limits are not readily discernable. A possible ringfort (KD010-005---) site lies c. 70m to the SE.</p> <p>No corresponding features on historic mapping. Aerial imagery (EirGrid Ortho photography) shows a pair of linear cropmarks, orientated roughly north-south, as well as a number of other cropmark features that correspond with a road and field boundaries depicted on historic mapping.</p> <p>A raised rectangular feature is perceptible on aerial photographs. The feature is possibly bisected by the former road and appears to curve west to east. A ringfort is located within the same field (KD010-005) to the south.</p>	Unknown	<p>Record of Monuments and Places - County Kildare (1995)</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p> <p><a href="https://www.cambridgeairphotos.com/location/bdu042/">https://www.cambridgeairphotos.com/location/bdu042/</a> [07 November 2021]</p>
AY_15	KD010-066	N/A	Toolestown	Kildare	Ring-ditch	693401 / 734497	<p>Cropmark of small circular-shaped enclosure (approx. diam. 8m) visible on Google earth aerial imagery.</p> <p>No corresponding features on historic mapping.</p> <p>A circular features is visible on Google aerial imagery, with a similar cropmark feature (AY_16) located to the west on the opposite side of the R406.</p>	Bronze Age	<p>Archaeological Survey of Ireland SMR</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p>
AY_16	KD010-067	N/A	Toolestown	Kildare	Ring-ditch	693296 / 734447	<p>Cropmark of small circular-shaped enclosure (approx. diam. 9m) visible on Google earth aerial imagery.</p> <p>No corresponding features on historic mapping.</p> <p>A circular features is visible on Google aerial imagery, with a similar cropmark feature (AY_15) located to the east on the opposite side of the R406.</p>	Bronze Age	<p>Archaeological Survey of Ireland SMR</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p>



ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
AY_17	KD010-028	Recorded Monument	Roosk	Kildare	Enclosure	691541 / 733297	On level pasture, formerly in tillage. Visible on aerial photographs (GSI N 468, 469) as the very faint cropmark of a fosse enclosing a large, circular area (est. diam. c. 120m). Not visible at ground. No corresponding features on historic mapping.	Unknown	Record of Monuments and Places - County Kildare (1995) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_18	KD010-070	N/A	Windgates	Kildare	Ring-ditch	693081 / 733087	Cropmark of circular-shaped ring-ditch (approx. diam. 8m) visible on Google earth aerial imagery. No corresponding features on historic mapping. Located in an arable field with another, larger cropmark of a circular enclosure (KD010-071) to the south-east.  A linear features running north-south is also perceptible as a cropmark to the west of the feature on aerial imagery (EirGrid Ortho photography).	Bronze Age	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_19	KD010-042	N/A	Barberstown Upper	Kildare	Enclosure	692654 / 731590	In tillage. Visible on a 1995 OSi Orthophoto and also on later Google earth and Bing satellite imagery as the cropmarks of two concentric fosses enclosing a circular area (estimated diameter c. 40m). A second, very faint cropmark c. 50m to the SE may be the remains of a ringbarrow. (pers. comm. D. Brennan, 30-03-2015). No corresponding features on historic mapping.	Unknown	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_20	KD010-022001	N/A	Barberstown	Kildare	Bawn	692674 / 731143	Some 6m S of a tower house (KD010-022001-) and separated from it by a later building, a short portion of wall (L 5.8m E-W; H 3.1m; T 1m) built of roughly coursed rubble masonry contains a blocked loop, and may be the remains of a bawn wall. A tall gate pier at its W end is not bonded to the wall and appears to be a later feature.  No corresponding features on historic mapping.	Post-medieval	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
AY_21	KD010-057	N/A	Barberstown	Kildare	Barrow - ditch barrow	692558 / 731133	One of a group of nine ditch-barrows (KD010-057----/065-) located in same field. Cropmark of circular-shaped enclosure/barrow (approx. diam. 13m) intersected at E by field boundary visible on Google earth aerial imagery. Bisected by a field boundary to the east. In an arable field with a cluster of circular cropmarks to the south-west. No corresponding features on historic mapping.	Bronze Age	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_22	KD010-058	N/A	Barberstown	Kildare	Barrow - ditch barrow	692523 / 731116	One of a group of nine ditch-barrows (KD010-057----/065-) located in same field. Cropmark of circular-shaped enclosure/barrow (approx. diam. 10m) visible on Google earth aerial imagery. No corresponding features on historic mapping.	Bronze Age	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_23	KD014-096	N/A	Longtown	Kildare	Ring-ditch	690299 / 730172	Cropmark of circular-shaped ring-ditch (approx. diam. 10m) visible on Google earth aerial imagery. No corresponding features on historic mapping.	Bronze Age	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_24	KD014-001	Recorded Monument	Ballynagappagh (Clane Ed)	Kildare	Ringfort - rath	684904 / 729057	On a very gentle NW-facing pasture slope. A small, poorly preserved, circular area (diam. 24m) is defined by a low, earthen bank (Wth 2.6-3.8m; int. H 0.4-0.6m; ext. H 0.8-1m) NW-NE-SE, partly hedged as a field boundary NE-E-SE, and abutted externally along N by a landscaped garden. A possible entrance on the N side, noted in 1972 (SMR file), is no longer clearly identifiable. The interior slopes gently down to NW and contains a coppiced hazel stand. Depicted on historic mapping as a sub-circular area with a field boundary abutting its eastern extent. Later mapping shows an earthwork of the north-eastern section only, with an area delimited by a dashed line	AD 500 – 1169	Record of Monuments and Places - County Kildare (1995) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							and shown as tree-covered. Aerial imagery (EirGrid Ortho photography) shows the areas as overgrown with trees / vegetation.		
AY_25	KD014-059	N/A	Ladycastle Upper	Kildare	Enclosure	690311 / 727931	Digital Globe aerial photograph shows the cropmark of a curvilinear enclosure (approx. diam. 58m N-S) defined by a fosse. Cropmarks of plough-levelled field boundaries located 110m to SSE; chronological relationship uncertain. Some of these field boundaries are depicted on the 1838 ed. OS 6-inch map. These linear cropmarks may be the remains of a field system of post-1700 date. No corresponding features on historic mapping. A sub-circular cropmark is visible on aerial imagery (EirGrid Ortho photography) to the east of a field boundary, in an arable field.	Unknown	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_26	KD014-032; RPS B14-07	Recorded Monument; Protected Structure	Firmount East (Clane Ed)	Kildare	Mound	686334 / 726464	On a low N-S ridge in mixed tillage and pasture. The monument is a partially overgrown, circular, round-topped, earthen mound (diam. at base c. 22m; diam. at top c. 5.5m; H c. 4m) with gently sloping sides, which are crossed NE-SW by old cultivation ridges. Visible on a 2005 aerial photograph (OSi Orthophoto). A circular mound is depicted on historic mapping, surrounded by a square boundary of trees. Later mapping depicted the circular mound in a field, identified as a 'moat'. A low mound is visible from the L2002, topped with trees.	12th - 13th century	Record of Monuments and Places - County Kildare (1995) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2019 [07 November 2021]
AY_27	KD014-054	N/A	Millicent Demesne	Kildare	Font (present location)	687361 / 725841	The present location of a font found in the wall of the church tower (KD014-026002-) in Clane village (see KD014-026010- for its original location), but moved to the church of 'St Michael and All Angles' (consecrated in 1883) in Millicent. A plain, square, granite font (dims. L 0.68m; Wth 0.68m) contains a	Medieval	Archaeological Survey of Ireland SMR

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							square basin (dims. L 0.49m; Wth 0.49m; D 0.16m). (Bradley et al. 1986, vol. 2, 145)		
AY_28	KD014-040	Recorded Monument	Castlesize	Kildare	Castle - unclassified	688611 / 724877	According to the OSL (Herity 2002, 46 (141)) '... it is said, there was formerly a Castle, of which, a vestige does not remain now'. On the landscaped grounds of Castlesize house, c. 150m E of the River Liffey. There was no trace of the castle visible in 1985 (SMR file). The site of a castle is identified on historic mapping in the demesne of Castlesize (DL_18). No features perceptible in this location on aerial imagery.	Unknown	Record of Monuments and Places - County Kildare (1995) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_29	KD014-041003	N/A	Bodenstown	Kildare	Font	689044 / 724810	In Bodenstown church (KD014-041001-). Two granite pieces appear to be part of the same, possibly 13th century baptismal font. One piece is square (dims. L 0.67m; Wth 0.67m) with a central, circular perforation (upper diam. 0.23m; base diam. 0.009m) and forms part of the base. The second, slightly larger piece (dims. L 0.8m; Wth 0.8m) contains a shallow basin which has small, opposing mortices. Sherlock (1899-1902, 298-9) explains that the opposing mortices on a very similar font (KD014-042002-) from Sherlockstown, c. 1 mile to the ESE, would have contained 'iron rivets leaded into the stone for the cover and lock required by the Constitution of Edward, Archbishop of Canterbury, in 1236'.	Medieval	Archaeological Survey of Ireland SMR
AY_30; AH_13	KD014-041001-; RPS B14-02	Protected Structure	Bodenstown	Kildare	Church	689044 / 724808	A roll dated 1352 records the 'church of Baledwenii/Baldewynii/Baldewynye' (Bodenstown) as belonging to the priory of Connell and it was still recorded as a possession in an Inquisition of 1606 (Price 1953, 200-01). According to Sherlock (1909-11, 223), '... church, chancel and books (were) in good order about the year 1612 when Bodenstown was held along with the vicarage of Clane by John Golborne, Bishop and Archdeacon of Kildare.' In the N sector of a	Medieval	Archaeological Survey of Ireland SMR Record of Protected Structures Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							<p>graveyard (KD014-041002-). A fairly poorly preserved, ivy-clad, rectangular structure (int. dims. L 16.4m E-W; Wth 6.6m N-S) comprises the N, S and W walls of a nave, standing to full height and built of roughly dressed, uncoursed limestone, and the grassed-over foundation wall line of the E gable wall. A slightly raised, grassed-over area (L c. 7m E-W) immediately to the E is the site of a probable chancel, which appears to lie slightly off-line, to the S of the line of the nave. The nave is entered through a nice, round-headed doorway (Wth 1.05m; H 1.68m), with beam-slot hole inside the N jamb, to the N of centre of the W gable wall, which is surmounted by a bellcote. The nave is lit by a round-headed window in the W gable wall and by two, narrow windows in the S wall; one round-headed and the other square-headed. The nave contains fragments of a font (KD014-041003-) and Wolfe Tone's grave abuts the S wall. (Killanin and Duignan 1967, 228-9)</p> <p>A church is depicted on historic mapping as a rectangular structure with a projecting porch to the west. The church is positioned in the centre of a sub-rectangular graveyard. Later mapping identified the church 'in ruins' and includes 'Wolfe Tone's Grave'. The building is depicted as three walls (north, west, and south) with a projecting bay to the south.</p> <p>The church is located within its associated enclosed graveyard (AY_31), south of the L2010. The structure comprises the ruinous western gable and sections of the north and south rubble stone elevations. The remains of the western porch also remain.</p>		2009 [11 October 2021]
AY_31	KD014-041002	N/A	Bodenstown	Kildare	Graveyard	689044 / 724781	<p>On the S side of a road, on the narrow summit of a short, low, N-S pasture ridge in an area of mixed tillage and pasture. An almost square area (dims. L c. 70m; Wth c. 70m) is enclosed by a stone wall and entered from the road along the N. Contains a church (KD014-</p>	Post-medieval	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25",

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							<p>041001-) in the N sector, with the main concentration of burials to its S. The oldest, legible grave markers date to the 19th century and stand to the E and W of the church. The E and W perimeter and S-third of the interior are planted with palm trees.</p> <p>A square graveyard surrounded by a low rubblestone wall, with trees also lining the boundary. Includes a ruinous church and 'Wolfe Tone's Grave'. The extent of the graveyard has changed from that depicted on historic mapping, with an extension to the south.</p>		1888-1913 Google StreetView 2009 [11 October 2021]
AY_32	KD014-062	N/A	Castlesize	Kildare	Barrow - unclassified	688409 / 724218	<p>Cropmark of circular-shaped enclosure (approx. diam. 12m) visible on Google maps aerial photograph. Visible as a dark circular area of earth on aerial imagery (EirGrid Ortho photography) to the north of the Sallins Bypass, in an arable field. Forms part of a group of possible barrows, including AY_33 and AY_34.</p>	Bronze Age	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_33	KD014-073	N/A	Castlesize	Kildare	Barrow - ditch barrow	688644 / 724200	<p>Cropmark of circular shaped enclosure (approx. diam. 7m) visible on Google Earth imagery taken 28/06/2018.</p> <p>No corresponding features depicted on historic mapping.</p> <p>Located in an arable field to the south of the Sallins Bypass. Forms part of a group of possible barrows including AY_32 and AY_34.</p>	Bronze Age	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_34	KD014-076	N/A	Castlesize	Kildare	Barrow - ditch barrow	688590 / 724128	<p>Cropmark of circular shaped enclosure (approx. diam. 9m) visible on Google Earth imagery taken 28/06/2018.</p> <p>No corresponding features depicted on historic mapping.</p> <p>Located in an arable field to the south of the Sallins Bypass, immediately to the west of a field boundary. Forms part of a group of possible barrows including AY_32 and AY_33.</p>	Bronze Age	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
AY_35	KD014-074	N/A	Castlesize	Kildare	Enclosure - large enclosure	688419 / 724116	Cropmark of large circular shaped enclosure (approx. diam. 90m) with entrance gap at S bisected by road excavation trench visible on Google Earth imagery taken 28/06/2018. In an area of arable fields, bisected by Sallins Bypass. No corresponding features depicted on historic mapping.	Unknown	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_36	KD019-081	N/A	Osberstown	Kildare	Ring-ditch	687886 / 722860	Cropmark of circular-shaped area (approx. diam. 10m) visible on Google earth aerial imagery. No corresponding features depicted on historic mapping. A possible circular cropmark, of similar size and form is visible on aerial imager to the west, along with a number of linear features which correspond with historic field boundaries. A darks area of soil is visible on aerial imagery (EirGrid Ortho photography).	Bronze Age	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_37	KD019-068	N/A	Jigginstown	Kildare	Fulacht fia	686867 / 719323	In 2005, archaeological monitoring (Licence no. 05E0442: <a href="http://www.excavations.ie">www.excavations.ie</a> ) of topsoil-stripping associated with the construction of the Millennium Park Western Link Road identified a fulacht fia on the edge of a natural peat basin. It was subsequently excavated (Licence no. 05E0524: <a href="http://www.excavations.ie">www.excavations.ie</a> ). A low, probably originally U-shaped mound (dims. L 8m N-S; Wth 6.8m) was composed of burnt sandstone, charcoal and peaty clay. A shallow rectangular trough (dims. L 1.5m; Wth 1.2m; D 0.2m) at the N edge contained a stake hole in each corner, suggesting it once contained a wooden structure. Some 23 stake-holes were found immediately S of the trough, of which 13 formed the outline of an oval structure. Material from the mound yielded a radiocarbon date of 3869 ± 52 BP (2480-2190 cal BC at 2 sigma), while material from the trough returned 3926 ± 71 BP (2620-2190	Bronze Age	Archaeological Survey of Ireland SMR <a href="https://excavations.ie/report/2005/Kildare/0013779/">https://excavations.ie/report/2005/Kildare/0013779/</a> [07 November 2021]



ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							cal BC at 2 sigma). A second fulacht fia (KD019-028---) lay c. 400m to the W.		
AY_38 <sup>44</sup>	KD019-032	Preservation Order; Register of Historic Monuments	Jigginstown	Kildare	Gatehouse	687900 / 718970	It may be one of two castles (see KD019-034---- also) in the possession of Roland FitzEustace in 1486 (Tickell 1960, 368). On level pasture c. 35m W of 'Jigginstown Castle' (KD019-033001-), a very substantial 17th century building, and c. 90m NNE of 'Castle Rag' (KD019-034----), a small tower house. A now blocked-up and partially ivy-clad, plain, rubble-built arch (dims. Wth 4.55m E-W; H 3.5m) springs from a solid rectangular column (dims. L 2.1m N-S; Wth 1.3m) on the W and from a small, rectangular, three-storied, tower with a substantial base batter (H2.85m) on the E, which projects N (L 1.8m) from the face of the archway (dims. L 3.9m N-S; Wth 2.6m). The tower is entered through a narrow (Wth 0.7m) square-headed doorway at the S end of its W wall, just inside the arch. Immediately inside on the left (N), a short, narrow passageway leads N to a small embrasure (dims. L 1.15m E-W; Wth 0.9m) containing a now blocked loop, looking E. The embrasure is floored with large flags one of which at W is broken and under which a narrow (Wth 0.8m), partially rubble-filled, sub-floor passage running E and then turning to run S can be seen. A spiral stairs, lit by a double-splayed loop looking S, climbs anti-clockwise to first-floor level where a partially robbed doorway leads W to a wall-walk above the archway. The stairs rises towards a second-floor, but the steps are in an unstable condition. Externally, there is a small garderobe ope (dims. Wth 0.3m; H 0.4m) just above ground level (H 1m) near the N end of the E wall. The remains of a bawn wall runs S from the SW angle of the tower (dims. traceable L c. 6.1m; H 2.9m; T 0.8m) and contains a loop.	15th century	Preservation Orders (2019) Kildare County Development Plan 2017 - 2023 Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2021 [07 November 2021]

<sup>44</sup> Please note this constraint is located beyond 100m from the route option(s); however, has been included as it forms part of the Jigginstown Castle complex.

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							<p>The remains of a tower immediately adjacent to the R445. Overgrown with mature trees in close proximity. A brick and rubblestone wall with substantial buttresses and a rectangular building with a slate roof are located immediately to the west. Forms part of the Jigginstown Castle complex. A belt of established trees and vegetation lines the eastern boundary of the complex.</p> <p>Depicted on historic mapping as part of two long ranges adjacent to the road. Later mapping shows the roofless tower, depicted in a similar style to Castle Rag, with a long attached range extending to the east.</p>		
AY_39	KD019-033001	National Monument; Register of Historic Monuments	Jigginstown	Kildare	House - 17th century	687999 / 718963	<p>A National Monument (No. 528) in State care. Built in the 1630's by Thomas Wentworth, Earl of Stafford, and Lord Deputy of Ireland (1633-7) as a summer residence for himself and as an intended (but never used) residence for King Charles 1. Possibly designed by John Allen, its completion date is uncertain, but by the time of the Civil Survey (1654-6) it was already in ruins (Simington 1952, 66). The Stafford Papers of c. 1665 describe the house as having been, 'A Noble Howse built in Siggenstown by my Lords your ffather which cost £20,000. It is a Double Brick howse all in length, free stone about the Windowes and some Collumes and pavem[en]ts of Marble. The ffront thereof 120 yards and it is the largest and most magnificent front that ever I saw to w[hi]ch proportions the Gardens answer in a Square having a sweet rivulett running through it: formerly very beautiful in Walles Groves and Trees. But now these are not only cutt down and defaced but a great [?] of the floores in the middle p[ar]ts of the Howse are fal[l]en downe.' An extremely long (L c. 100m E-W; Wth c. 18m) mainly brick-built, tall single-storey (with possible attic accommodation) over basement structure comprises a central block originally flanked by two slightly</p>	17th century	<p>National Monuments in State Care: Ownership &amp; Guardianship - Kildare (2009)</p> <p><a href="https://www.logainm.ie/Eolas/Data/Brainse/logainm.ie-map-j-noble-and-j-keenan-1752-grand-jury-kildare-south.jpg">https://www.logainm.ie/Eolas/Data/Brainse/logainm.ie-map-j-noble-and-j-keenan-1752-grand-jury-kildare-south.jpg</a> [09 November 2021]</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p> <p>Google StreetView 2019 [07 November 2021]</p> <p><a href="https://digital.ucd.ie/view-w-media/duchas:4952388/canvas?manifest=https://data.ucd.ie/api/img/manifests/duchas:4952">https://digital.ucd.ie/view-w-media/duchas:4952388/canvas?manifest=https://data.ucd.ie/api/img/manifests/duchas:4952</a></p>

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							<p>projecting (N) wings; the W one of which has been removed. A winged staircase near the E end of the N wall provided access to the main entry, and there were two rear doors; one centrally placed and the second near the W end of the S wall. The basement is walled with mortared stone, lit by mullioned windows and roofed with brick vaulting while the main floor is walled with brick and lit by large, timber framed windows. A central spine-wall (E-W) supported pitched roofs to each side. Massive brick chimney stacks rise from stone bases in the basement, and have wide fireplaces lined with very small red bricks. An ongoing conservation programme was informed by a detailed survey of the building and some archaeological excavation (Licence nos. 01E1109 and 02E1603: www.excavations.ie). Construction debris for the house overlay the truncated remains of a ploughed field, which overlay a number of features (not excavated) probably associated with medieval pottery found in the residual ploughsoil, suggestive of earlier, medieval settlement possibly associated with a spring now located in the basement of the house. One of two large box drains carrying water from the basement (and from the roof via internal downpipes) was found to have failed. During construction, part of the drain close to the house had been exhumed and a temporary sump cut and filled, and a new drain appears to have been quarried into the north-west corner of the basement. The building was originally fully floored, roofed, and plastered internally. Finds suggest the building was roofed with slate and glazed ridge tiles. Part of the formal gardens (KD019-033003-) survive to S and traces of a large, possibly associated enclosure (KD019-030002-) were noted in 1979 (SMR file). An earthen bank set against the S-side of the building, providing a terrace overlooking the garden, had a limekiln (KD019-033004-) built into it, and a midden (KD019-033005-) was also found.</p>		<p><a href="#">388</a> [07 November 2021]  <a href="https://digital.ucd.ie/view/media/duchas:4819384/canvas?manifest=https://data.ucd.ie/api/img/manifests/duchas:4819384">https://digital.ucd.ie/view/media/duchas:4819384/canvas?manifest=https://data.ucd.ie/api/img/manifests/duchas:4819384</a> [07 November 2021]</p>

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							<p>(Vicars 1891-5, 19-24; Fitzgerald 1915-17, 491; Strath 1935-45, 343-7; Leask 1941, 148-9; Costello 1946, 422; Costello 1966-7, 268; Killanin and Duignan 1967, 384; Craig 1971, 50-8; Harbison 1975, 122; Bence-Jones 1978, 161; Meagher 1979-80, 118; Fenlon 2011, 207-223)</p> <p>The ruins of a large brick house immediately adjacent to the R445. Overgrown with some mature trees in proximity. A modern metal security fence surrounds the buildings and scaffolding has been erected around both east and west gable ends. Forms part of the Jigginstown Castle complex. A belt of established trees and vegetation lines the eastern boundary of the complex.</p> <p>Jigginstown is depicted on Noble &amp; Keenan's Map of county Kildare (1752) as a crenelated structure. Depicted on historic mapping as a substantial rectangular range, immediately to the south of the road and identified as 'The Buildings (in ruins)' with a rectangular garden and 'Jigginstown House' to the south. Later mapping shows the layout of the roofless house, identified as 'Jigginstown Castle (in ruins)', with a sunken garden and the later house to the south. Belonged to the great family of 'Geraldines' and is dated back to the sixteenth century. It is believed that as there was no means of transport that a human chain of men stretched from Dublin to Naas and passed the stones for the building from man to man. In Kildare the story is still credited. In any castle the castle must have been a magnificent structure and a very large one judging by the ruins still left. It is still in a fairly good state of preservation. There are underground cellars under the ruins of all the apartments. There is also an underground tunnel which runs from Naas to Newbridge.</p> <p>Situated on the Newbridge Road is the Jigginstown buildings. It was built in the seventeenth century by</p>		

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							the Earl of Stafford who was viceroy in Ireland. He built it so to have a mansion suitable for the king in case King Charles ever came on a visit to Ireland. He got the brick from Denmark. A legend tells us that he had his men lined from Dublin to Naas and they passed the bricks from one to another till they arrived at Jigginstown. It is about one hundred and fifty yards long. There are many underground cellars in it. Before it was finished the Lord Deputy was called over to England and was beheaded for making friends with the Irish. A legend tells us that in one of the cellars is a spring well which used to supply the house with water. It is said that there is gold buried there and that a black dog minds it. There is a tunnel leading to Killashee from Jigginstown.		
AY_40	KD019-033004	Preservation Order	Jigginstown	Kildare	Kiln - lime	688005 / 718954	<p>An ongoing conservation programme at Jigginstown House (KD019-033001-) was informed by a detailed survey of the building and some archaeological excavation (Licence nos. 01E1109 and 02E1603: <a href="http://www.excavations.ie">www.excavations.ie</a>). An upcast bank was found, set against the south side of the building, providing a terrace overlooking the large sunken garden (KD019-033003-). A limekiln was built into the bank and was used, perhaps, to provide the lime needed for the internal plaster.</p> <p>No corresponding feature is depicted on historic mapping. Not visible on aerial imagery.</p> <p>Located in a bank to the south of the main building, in a grassed area, encroached on by a clump of mature trees. Forms part of the Jigginstown Castle complex. A belt of established trees and vegetation lines the eastern boundary of the complex.</p>	17th century	<p>Preservation Orders (2019)</p> <p>Kildare County Development Plan 2017 – 2023</p> <p><a href="https://excavations.ie/report/2002/Kildare/0008231/">https://excavations.ie/report/2002/Kildare/0008231/</a> [09 November 2021]</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p>
AY_41	KD019-033005	N/A	Jigginstown	Kildare	Midden	688007 / 718953	<p>An ongoing conservation programme at Jigginstown House (KD019-033001-) was informed by a detailed survey of the building and some archaeological</p>	17th century	<p>Archaeological Survey of Ireland SMR</p> <p><a href="https://excavations.ie/r">https://excavations.ie/r</a></p>

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							excavation (Licence nos. 01E1109 and 02E1603: www.excavations.ie). A midden was found and contained window glass and kitchen waste, and suggested that the house was occupied before construction was complete.		<a href="#">eport/2002/Kildare/0008231/</a> [05 November 2021]
AY_42	KD019-033002	Preservation Order; Register of Historic Monuments	Jigginstown	Kildare	Enclosure	688013 / 718951	<p>The E-half (NNE-E-SSE) of a very large, possibly oval enclosure (est. diam. c. 150m N-S) is defined by an inner, flat-bottomed fosse (Wth 3m; D 1.4m), a slight, outer earthen bank, and a second, narrower, outer fosse (Wth 1.5m; D 1.4m). A field wall running N-S over the visible S-limits of the fosses contains two wide, flat, relieving-arches in line with them. These features would appear to have enclosed Jigginstown House (KD019-033001-) and garden (KD019-033003-), together with Castle Rag (KD019-034----) a small tower house, and a medieval gatehouse (KD019-032--). While the fosses may have been partly defensive, they probably also served landscaping and drainage functions. Modern development works have removed some surface elements, but sub-surface features are likely to survive intact. In 1996, archaeological monitoring (Licence no. 96E132: www.excavations.ie) of the excavation of a gas-pipe trench (Wth 0.85m; D 0.95-1.3m) along the main road running E-W through the enclosed area in front of Jigginstown House revealed that the road level had been built up in relatively modern times with an infill deposit of stone and clay which produced modern pottery. The original ground surface, a light yellow clay, lay at 1.3m below existing ground level.</p> <p>No corresponding feature is depicted on historic mapping.</p> <p>An ephemeral earthwork is visible on an historic aerial photograph in a field to the north of the complex. The earthwork comprises two parallel linear features, with a possible bank, running east-west. A similar, equally</p>	17th century	Preservation Orders (2019) Kildare County Development Plan 2017 - 2023 Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 <a href="https://www.cambridgeairphotos.com/location/asw018/">https://www.cambridgeairphotos.com/location/asw018/</a> [07 November 2021] <a href="https://www.cambridgeairphotos.com/location/asw017/">https://www.cambridgeairphotos.com/location/asw017/</a> [07 November 2021]

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							ephemeral feature is also located in a field to the east of the complex. Forms part of the Jigginstown Castle complex.		
AY_43	KD019-033003	Preservation Order; Register of Historic Monuments	Jigginstown	Kildare	Designed landscape - formal garden	688001 / 718921	<p>The Stafford Papers of c. 1665 describe Jigginstown House (KD019-033001-) and gardens as having been, 'A Noble Howse built in Siggenstown by my Lords your ffather which cost £20,000. It is a Double Brick howse all in length, free stone about the Windowes and some Collumes and pavem[en]ts of Marble. The ffront thereof 120 yards and it is the largest and most magnificent front that ever I saw to w[hi]ch proportions the Gardens ansvere in a Square having a sweet rivulett running through it: fromerly very beautiful in Walles Groves and Trees. But now theise are not only cutt down and defaced but a great [?] of the floores in the middle p[ar]ts of the Howse are fal[l]en downe.'</p> <p>According to tradition, the gardens were formally laid out with terraces and fishponds (Bence-Jones 1978, 161). The majority of these features have apparently been levelled by modern road-making and the construction of the Grand Canal, but the remains of a sunken garden (dims. L c. 80m E-W; Wth c. 55m N-S) and gazebo survive to the S of the house. An ongoing conservation programme was informed by a detailed survey of the building and some archaeological excavation (Licence nos. 01E1109 and 02E1603: <a href="http://www.excavations.ie">www.excavations.ie</a>). An upcast bank was found, set against the south side of the building, providing a terrace overlooking the remains of the garden. The bank was built up late in the construction of the house and was built against scaffolding. A limekiln (KD019-033004-) was built into the bank. The terrace around the sunken garden was not completed, sloping away to the east and exposing the rough footings of the house. The bank was poorly surfaced with a narrow path. There was no indication of planting before the current</p>	17th century	Preservation Orders (2019) Kildare County Development Plan 2017 - 2023 Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913



ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							standing trees (planted in the early-20th C). An associated enclosure (KD019-033002-) may have served defensive, drainage and landscaping functions. A rectangular area is depicted to the south of Jigginstown Castle, with Jigginstown House towards the centre on historic mapping. The area is tree-lined and includes a drive from the road, leading to the house, and a smaller square area with trees to the south of the house. Later mapping shows this area to be sunken, with dispersed trees within. Aerial imagery shows the areas as grassed with a clump of mature trees, and a trees lining the eastern boundary. Forms part of the Jigginstown Castle complex.		
AY_44 <sup>45</sup>	KD019-034	Preservation Order; Register of Historic Monuments	Jigginstown	Kildare	Castle - tower house	687866 / 718878	It may be one of two castles (see KD019-032---- also) in the possession of Roland FitzEustace in 1486 (Tickell 1960, 368). Stands near the top of a short, very gentle, N-facing, pasture slope, c. 100m SSE of a gatehouse (KD019-032----) and c. 110m SSE of Jigginstown House (KD019-033001-). A really small, almost square (ext. dims. L 5.1m ENE-WSW; Wth 4.65m; int. dims. L 3.3m ENE-WSW; Wth 2.85m), two-storied structure with parapets and a slightly projecting (L 0.9m) stairs tower at the N-angle is built of rough, rubble, limestone masonry with large, well-dressed quoins (wall T. 0.9m). The walls are not battered but taper inwards slightly towards the top. Entered through a partially robbed-out doorway in the ENE wall, the ground floor is lit by a double-splayed loop in each of the four walls and roofed by a barrel-vault (E-W) bearing traces of wicker-centring, under which beam-slot holes mark the floor line of a loft, which is lit by narrow loops in the ENE and WSW walls. The very narrow spiral stairs (Wth 0.6m) is accessed through a	15th century	Preservation Orders (2019) Kildare County Development Plan 2017 - 2023 Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913

<sup>45</sup> Please note this constraint is located beyond 100m from the route option(s); however, has been included as it forms part of the Jigginstown Castle complex.

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
							<p>plain, square-headed doorway in the N corner and is lit between ground and first-floor levels by a loop looking ENE and, above, by a slightly larger rectangular window looking NNW, and between first-floor and parapet level by a rectangular window looking ENE and, above, a loop looking WNW. The first floor is entered through a plain square-headed doorway in the N corner. The floor is lit by two opposing, large, partially robbed-out, square-headed windows with traces of window seats in the ENE and WSW walls, and a blocked loop is visible in the SSE wall. A robbed-out fireplace with red brick mantle-supports in the NNW wall is serviced by a chimney which projects from the outer wall face, supported on two corbels. The battlement level is inaccessible, but lower courses of crenelations and gutters survive on the projecting parapet, and the stairs tower is also crenelated. (Vicars 1891-5, 58; Fitzgerald 1921, 388-91)</p> <p>'Castle Rag' is depicted on historic mapping in an large field surrounded by dispersed trees to the west of Jigginstown House, and south-west of the other possible tower house (AY_38). Later mapping identifies the tower as 'in ruins' and depicts the building as roofless. The surrounding trees are also no longer depicted.</p> <p>The tower house is surrounded by a rubblestone wall, in a grassy field set back from the road. The tower remains visible from the R445, to the north; however, is screened from the east by a mature tree line. Forms part of the Jigginstown Castle complex.</p>		
AY_45	KD024-038	N/A	Stephenstown South	Kildare	Redundant record	687392 / 713131	Included on the SMR (1988) as 'Potential site - aerial photo' but subsequently 'Delisted' from the RMP (1995). The evidence was not deemed sufficient to warrant accepting this as an archaeological monument.	N/A	Archaeological Survey of Ireland SMR

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Location / Coordinates	Description	Approx. Date	Sources
AY_46	KD024-050004	N/A	Dunnstown	Kildare	Enclosure	687302 / 712740	One of six, small subrectangular cropmarks (KD024-050001- to KD024-050006-) visible on an aerial photograph (GSI N 337-6). Located in level, well-drained pasture. No earthworks were visible at the time of visit, but there was heavy grass cover. No corresponding features on historic mapping. No above ground remains.	Unknown	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_47	KD024-050005	N/A	Dunnstown	Kildare	Enclosure	687328 / 712725	One of six, small subrectangular cropmarks (KD024-050001- to KD024-050006-) visible on an aerial photograph (GSI N 337-6). Located in level, well-drained pasture. No earthworks were visible at the time of visit, but there was heavy grass cover. No corresponding features on historic mapping. No above ground remains.	Unknown	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
AY_48	KD024-050006	N/A	Dunnstown	Kildare	Enclosure	687335 / 712719	One of six, small subrectangular cropmarks (KD024-050001- to KD024-050006-) visible on an aerial photograph (GSI N 337-6). Located in level, well-drained pasture. No earthworks were visible at the time of visit, but there was heavy grass cover. No corresponding features on historic mapping. No above ground remains.	Unknown	Archaeological Survey of Ireland SMR Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913

Table A2: Inventory of Architectural Heritage Constraints

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
AH_01	NIAH 14404905	N/A	Phepotstown	Meath	Country house	689355 / 744178	Detached five-bay two-storey country house also MH049-107), built c.1780. Recessed single-bay two-storey wing and outbuilding attached to east end. Hipped slate roof with rendered chimneystacks and cast-iron rainwater goods. Timber sash windows with limestone sills. Timber panelled door with cast-iron fanlight above, set in ashlar limestone door surround. Former gate lodge to site, with all openings now blocked. Rendered entrance piers with	1760 - 1800	<a href="https://www.buildingsofireland.ie/buildings-search/building/14404905/larch-hill-larch-hill-demesne-phepotstown-meath">https://www.buildingsofireland.ie/buildings-search/building/14404905/larch-hill-larch-hill-demesne-phepotstown-meath</a> [Accessed 11 October 2021].

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							<p>limestone wheel guards and cast-iron double gates.</p> <p>The modest form of this country house is enhanced by the retention of many original features and materials, such as the slate roofs and timber sash windows. The façade is enlivened by the delicate decorative fanlight. The house forms an interesting group with the other related buildings and structures, such as the outbuildings, walled garden and follies, which were built by Robert Watson and create a picturesque ferme ornee.</p> <p>The house is set within its demesne lands (DL_04) which includes a former gate lodge, mausoleum (MH049-105), and folly (NIAH 14404908), as well as rendered entrance piers with limestone wheel guards and cast-iron double gates.</p> <p>Tradition notes a previous owner believed he would return after death as a fox so constructed a fox-cover in the grounds.</p>		<p>Google StreetView 2019 [11 October 2021]</p> <p><a href="https://digital.ucd.ie/view-media/duchas:4782508/canvas/duchas:4740627?manifest=https://data.ucd.ie/api/img/manifests/duchas:4782508">https://digital.ucd.ie/view-media/duchas:4782508/canvas/duchas:4740627?manifest=https://data.ucd.ie/api/img/manifests/duchas:4782508</a></p> <p>[Accessed 4 November 2021].</p>
AH_02	RPS MH049-110	Protected Structure	Rodanstown	Meath	Church	690574 / 741328	<p>Rodanstown Church</p> <p>A ruinous church set within an oval graveyard (AY_05), on the site of a medieval parish church. The stone structure comprises a roofless single storey, rectangular building with a large apse. The arched windows have been blocked up. The church is located in an elevated position, overlooking the bend in the road, surrounded by a number of memorials within the graveyard and enclosed by a low rough-cast wall. Views to the south and west limited by a mature belt of trees.</p> <p>A church is depicted on historic mapping as a rectangular building, orientated north-west to south-east; however, later mapping shows the curved apse, as well as the east-west orientation, of the current structure.</p>	Post-medieval	<p>Record of Protected Structures</p> <p>Google StreetView 2019 [11 October 2021]</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p>
AH_03	RPS MH049-	Protected Structure	Moyglare	Meath	Church	692697 / 739762	<p>Saint Paul's Church of Ireland Church</p> <p>Former church, built c.1870, with four-bay side elevations to nave, single-bay chancel to west, three-stage tower with ashlar limestone spire to north-east corner and entrance</p>	1860 - 1880	<p><a href="https://www.buildingsofireland.ie/buildings-search/building/14404901/saint-pauls-">https://www.buildingsofireland.ie/buildings-search/building/14404901/saint-pauls-</a></p>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
	112; NIAH 14404901						<p>porch to south elevation. Now in use as a detached house. Pitched slate roofs with ridge cresting, limestone copings, limestone eaves dentils and cast-iron rainwater goods. Snecked and rock-faced limestone walls with buttresses and ashlar limestone quoins and dressings to openings. Cast-iron tracery to pointed window openings. Timber battened doors with strap hinges. Ashlar limestone piers with wrought-iron double gates and dressed limestone boundary walls. Graveyard to site.</p> <p>Saint Paul's Church, designed by Edward Mc Allister, is of an architectural form and design which is typical in many ways of church design in the late nineteenth and early twentieth centuries. The articulation of each section of the church into separate blocks is an interesting feature of this era. The tower, transepts, apse, vestry and porches are clearly identifiable forms from the exterior of the building. The treatment of the ashlar masonry is also representative of this time, with the rock-faced limestone contrasting with the ashlar limestone dressings, which add textural variation to the site. The carved stone gate piers, wrought-iron gates and carved stone grave markers enhance the setting of the church.</p> <p>A church is depicted on historic mapping within a roughly square graveyard. An additional building is also depicted to the north of the church. Later mapping shows this building in a square enclosure.</p> <p>The church is set within its associated graveyard, bounded by a low coursed rubble stone wall, with vertical copes. The church overlooks Moygale Road to the north, and fields to the south. While some mature trees are located within the boundary of the graveyard, views to and from the church are largely uninterrupted.</p>		<a href="http://church-of-ireland-church-moyglare-meath">church-of-ireland-church-moyglare-meath</a> [Accessed 11 October 2021] Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2019 [11 October 2021]
AH_04	RPS B10-10; NIAH 11901005	Protected Structure	Donaghstown	Kildare	Church / chapel	690582 / 734759	Donaghstown Catholic Church Detached seven-bay double-height Gothic-style Catholic church, c.1870, comprising five-bay double-height nave with lancet-arch openings, single-bay three-stage engaged	1850 - 1890	<a href="http://www.buildingsofireland.ie/niah/search.js?p?type=record&amp;county=KD&amp;regno=11901005">http://www.buildingsofireland.ie/niah/search.js?p?type=record&amp;county=KD&amp;regno=11901005</a>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							<p>corner tower to west on a square-plan with spire and two-bay double-height lower chancel to north-east gable end having single-bay single-storey sacristy projection to north-west. Gable-ended roof with slate (gabled to sacristy projection). Clay ridge tiles. Cut-stone coping to gables with trefoil motif. Cut-stone chimney stack to gable to sacristy projection. Cast-iron rainwater goods with decorative hoppers. Pyramidal roof to spire with slate (fish-scale pattern). Hammer-dressed snecked limestone walls. Stepped buttresses to corners. Lancet-arch window openings (paired to south-west gable end; tripartite to north-east gable end with hood moulding over). Cut-stone chamfered block-and-start surrounds. Fixed-pane leaded windows. Lancet-arch openings to tower. Louvered timber panels to top stage. Pointed-arch door opening. Cut-stone chamfered surround. Hood moulding over. Timber panelled doors. Full-height interior open into roof. Glazed timber panelled internal porch. Exposed timber roof construction on cut-stone corbels. Gothic style altar and reredos to chancel. Set back from road in own grounds. Lawns to site. Rubble stone boundary wall to site.</p> <p>Donaghstown Catholic Church is a fine example of a mid to late nineteenth-century Gothic style church, which retains much of its original aspect. Composed on a simple, almost single-cell plan the scale of the church and the plain treatment of the external elevations achieves an atmosphere of intimacy. Many original features and materials survive intact, including the early leaded fenestration and a slate roof. The interior is also of considerable interest with a chancel that contains fittings of artistic interest, while the exposed timber roof construction is of some technical/engineering merit. The church is attractively set within its own landscaped grounds and the soaring spire is a prominent landmark that articulates the skyline. Prominently located on a wedge-shaped site on the crossroads the church is of social and historic significance as the ecclesiastical centre for the</p>		<p>[Accessed 11 October 2021]                      Ordnance Survey 25", 1888-1913                      Google StreetView 2019 [11 October 2021]</p>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							<p>Catholic population in the locality.</p> <p>The church is depicted on historic mapping, labelled 'R.C. Church'.</p> <p>The church is located on a wedge of land on the junction between the R408 and L5037 and is bounded by a low coursed rubblestone wall, and landscaped grounds. Views from the church are across the carriageways towards fields to the south and west. Views north and east are limited by a hedgerow, established vegetation, and buildings.</p>		
AH_05	RPS B10-09; NIAH 11901002	Protected Structure	Rathcoffey North	Kildare	Church / chapel	688134 / 732622	<p>Catholic Church of the Sacred Heart</p> <p>Detached two-bay double-height Gothic-style Catholic church, c.1820, on a cruciform plan comprising single-bay double-height nave with single-bay double-height transepts to north and to south (with flights of external steps to first floors) and single-bay double-height polygonal apse to east having pair of single-bay single-storey projecting polygonal flanking porches. Gable-ended roofs with slate (polygonal roofs to apse and to porches). Clay ridge tiles. Stone cross finials to gables to transepts. Cast-iron rainwater goods with trefoil motif to brackets. Nap rendered walls. Painted. Pointed-arch window openings. Stone sills. Fixed-pane stained glass windows. Square-headed door openings. Timber panelled doors. Double-height interior. Timber pews. Balustraded timber galleries to first floor to transepts. Decorative Gothic-style marble altar. Set back from road in own landscaped grounds. Freestanding belfry, c.1860, to south on a square plan with iron bell and slate roof. Gateway, c.1820, to east comprising pair of rendered piers with pair of cast-iron inner piers having decorative cast-iron gates with quatrefoil motif and fleur-de-lis finials.</p> <p>The Catholic Church of the Sacred Heart is a fine example of an early nineteenth-century pre-Emancipation church. Of modest scale and simple plan, with little ornamentation to the elevations of the nave, the church achieves a curious effect by being set with an almost blank east end facing the</p>	1800 - 1840	<p><a href="http://www.buildingsofireland.ie/niah/search.jsp?type=record&amp;county=KD&amp;regno=11901002">http://www.buildingsofireland.ie/niah/search.jsp?type=record&amp;county=KD&amp;regno=11901002</a> [Accessed 11 October 2021]</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p> <p>Google StreetView 2019 [11 October 2021]</p>



ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							<p>road - the combination of three polygonal bays (the apse and two porches) is an unusual feature. Also unusual are the flights of external stairs that access the galleries to the transepts, which allude to Italian models in their concept. The building retains many early or original features, including fenestration and slate roofs, while the interior is also of considerable interest including a marble altar that is of artistic importance. The church was patronised by a committee of local landlords, which emphasises the social and historic significance of the building as the ecclesiastical centre for the Catholic population in the region. Set within its own landscaped grounds, the church is an attractive feature in the area. The gates to the entrance are of considerable artistic merit and represent fine examples of early surviving cast-iron work.</p> <p>The church is depicted on historic mapping as a 'chapel', then later 'R.C. Church'. The church is set back from the R408 within its associated grounds, with views outward limited by established trees and vegetation.</p>		
AH_06	RPS B10-14; NIAH 11901001	Protected Structure	Moortown (Ikeathy By)	Kildare	Thatched Dwelling	687159 / 732329	<p>Detached five-bay single-storey lobby entry thatched house, extant 1837, on an L-shaped plan originally three-bay single-storey on a rectangular plan; single-bay (two-bay deep) single-storey projecting end bay with half-dormer attic (east). Pitched oat straw thatch roof, rope twist ridge with paired exposed stretchers having exposed scallops, rendered dwarf chimney stack on a T-shaped plan having concrete capping, and blind stretchers to eaves having blind scallops; pitched artificial slate roof (east) with ridge tiles, and cast-iron rainwater goods on roughcast eaves with cast-iron downpipes. Roughcast battered walls. Square-headed door opening with concrete threshold, and concealed dressings framing timber boarded door. Square-headed window openings with concrete sills, and concealed dressings framing one-over-one timber sash windows. Street fronted.</p> <p>A house identified as an integral component of the</p>	1700 - 1837	<p>Record of Protected Structures  <a href="https://www.buildingsofireland.ie/buildings-search/building/11901401/ballynagappagh-clane-ed-kildare">https://www.buildingsofireland.ie/buildings-search/building/11901401/ballynagappagh-clane-ed-kildare</a>                      [Accessed 11 October 2021]                      Ordnance Survey 6", 1837 – 1842                      Ordnance Survey 25", 1888-1913                      Google StreetView 2019 [11 October 2021]</p>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							<p>vernacular heritage of County Kildare by such attributes as the lobby entry plan form; the construction in unrefined local materials displaying a feint battered silhouette with sections of "daub" or mud suggested by an entry in the "House and Building Return" Form of the National Census (NA 1901; NA 1911); the disproportionate bias of solid to void in the massing; and the high pitched roof showing an oat straw thatch finish: meanwhile, aspects of the composition clearly illustrate the continued linear development or "improvement" of the house. Having been well maintained, the form and massing survive intact together with quantities of the original fabric, both to the exterior and to the interior, thus upholding much of the character or integrity of a house making a pleasing visual statement in a sylvan street scene.</p> <p>The house is depicted on historic mapping as a rectangular structure immediately adjacent to the road. Later mapping shows the house with other buildings to the east and south. The original single storey range has been joined with a later one and a half storey building to the east, and a single storey extension has been added to the west, with roughcast walls and a slate roof. Positioned immediately on Mooretown Drive, the house overlooks the road. While the view north is directly over the carriageway, views in other directions are screened by the surrounding established vegetation and trees, and other residential buildings.</p>		
AH_07	RPS B10-17	Protected Structure	Barberstown Upper	Kildare	House	692708 / 731810	<p>Greygates (house)                      Depicted on historic mapping as a rectangular building with projecting bays / extensions to the north, as well as a detached building. Located to the south-east of a gravel pit, in an enclosed plot.</p> <p>The house comprises a modest one and a half storey, five bay house, positioned perpendicular to the R406, of coursed rubble stone construction. Boundary of the plot remains extant; however, the outbuilding appears to have</p>	Post-medieval	Record of Protected Structures Ordnance Survey 25", 1888-1913 Google StreetView 2017 [11 October 2021]

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							been replaced with a concrete structure and the projecting bays / extensions are no longer present.		
AH_08	RPS B10-12	Protected Structure	Barberstown	Kildare	House	692724 / 731299	<p>Barberstown House</p> <p>Located on the roundabout junction between the R406 and R403, the house comprises a five bay, two-storey double pile building with an extension to the north gable. A complex of stone ranges arranged in a courtyard plan are located to the north. The principal view from the house is east, over the R406, across open fields. Views south and west (across a large lawn) are limited by established vegetation and mature tree lines.</p> <p>The current house appears to have replaced the 'L'-shaped 'Barberstown Cottage' depicted on historic mapping in the late 19th or early 20th century.</p>	Post-medieval	<p>Record of Protected Structures</p> <p>Google StreetView 2019 [11 October 2021]</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p>
AH_09	RPS B10-08	Protected Structure	Barberstown	Kildare	Castle	692669 / 731155	<p>Barberstown Castle</p> <p>The castle is depicted on historic mapping with three accompanying ranges to the west, positioned in a courtyard plan, and a lodge to the east in laid out grounds. Later mapping shows the grounds sub-divided and further buildings in the complex. A 'castle' is also labelled in gothic text indicating the location of the preceding medieval structure.</p> <p>The tower house comprises a coursed rubble masonry structure with two square corner towers with battered bases. The castle, now a hotel, has been extended and modified.</p> <p>Barberstown Castle comprises a large country house complex, now a hotel, that has been extended and altered, and includes a medieval tower house (KD010-022) with an associated roughly coursed rubble bawn wall (AY_20). The complex is set within established landscaped grounds, with views in all directions limited by intervening vegetation, trees and buildings.</p>	Post-medieval	<p>Record of Protected Structures</p> <p>Ordnance Survey 6", 1837 – 1842</p> <p>Ordnance Survey 25", 1888-1913</p> <p>Google StreetView 2017 [11 October 2021]</p>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
AH_10	RPS B14-75	Protected Structure	Irishstown Lower	Kildare	House	690554 / 729463	<p>Irishstown House</p> <p>Depicted on historic mapping, perpendicular to the drive, overlooking the River Liffey within its demesne lands (DL_12), with a ruined river bridge to the south. Later mapping shows the house with a substantial complex of buildings to the east, including a 'tank' and 'pump', a foot bridge is depicted to the south.</p> <p>The house comprises a double pile structure with two additional gable bays extending to the east and west. The view to the south is across the garden towards the river and north across pasture fields. The complex of buildings to the east remains; however, some of the ranges have been replaced with modern agricultural buildings. The river bridge and pigeon house remain extant to the south and west respectively.</p>	Post-medieval	Record of Protected Structures Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google aerial imagery [06 November 2021]
AH_11	RPS B14-36; NIAH 11901401	Protected Structure	Ballynagappagh	Kildare	Thatched House	685048 / 729269	<p>Detached five-bay single-storey direct entry thatched farmhouse, extant 1837, on a rectangular plan with single-bay single-storey lean-to windbreak. Hipped oat straw thatch roof overhanging lean-to slate roof (windbreak), rope twist ridge with grouped exposed stretchers having exposed scallops, rendered dwarf chimney stacks supporting terracotta or yellow terracotta tapered pots, and blind stretchers to eaves having blind scallops. Roughcast battered walls on rendered plinth. Square-headed door opening with concealed dressings framing timber panelled door. Square-headed window openings with concrete or rendered sills, and concealed dressings framing one-over-one timber sash windows. Set perpendicular to road with roughcast piers (south) or roughcast cylindrical piers (north) having capping supporting flat iron double gates.</p> <p>A farmhouse identified as an important component of the vernacular heritage of County Kildare by such attributes as the alignment perpendicular to the road; the elongated rectilinear direct entry plan form; the construction in unrefined local material displaying a battered silhouette</p>	1700 - 1837	Record of Protected Structures <a href="https://www.buildingsofireland.ie/buildings-search/building/11901401/ballynagappagh-clane-ed-kildare">https://www.buildingsofireland.ie/buildings-search/building/11901401/ballynagappagh-clane-ed-kildare</a> [Accessed 11 October 2021] Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2019 [11 October 2021]

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							<p>with sections of "daub" or mud suggested by an entry in the "House and Building Return" Form of the National Census (NA 1901; NA 1911); the disproportionate bias of solid to massing; and the high pitched roof showing an oat straw thatch finish. Having been well maintained, the form and massing survive intact together with substantial quantities of the original fabric, both to the exterior and to the interior, thus upholding the character or integrity of the composition. Furthermore, adjacent "tin roofed" outbuildings (----) continue to contribute positively to the group and setting values of a self-contained ensemble making a pleasing visual statement in a rural street scene. The house is depicted on historic mapping as a detached building, rectangular in plan, positioned roughly perpendicular to the road. The building is set within an irregular enclosure, with two other small ancillary buildings to the north-east and north. Later mapping shows further ranges added to the complex, including a long rectangular range immediately to the north-east, and an 'L'-shaped range to the north.</p> <p>A single-storey range positioned perpendicular to the R408, with an adjacent range extant to the north-east (with later corrugated roof). A low rendered boundary wall (approximately 0.6km in length) bounds the road, with two sets of gatepiers to north-west. A small modern lean-to has been added to the building.</p> <p>Forms part of a working farmyard.</p>		
AH_12	RPS B14-12	Protected Structure	Millicent Demesne	Kildare	Church and Lych Gate	687348 / 725849	<p>Millicent Church and Lych Gate</p> <p>Located within Millicent House demesne (DL_17), the church comprises a Hiberno-Romanesque building. The church was consecrated in 1883.</p> <p>The church is not depicted on historic mapping dating to the mid-19<sup>th</sup> century; however, is shown on later mapping, with the lych gate to the south-west, surrounded by a rectangular graveyard.</p> <p>Located on a rise towards the centre of the parish of Clane,</p>	1880s	<p>Record of Protected Structures</p> <p><a href="https://www.kildare.ie/e-history/index.php/church-of-st-michael-and-all-angels-millicent-clane/">https://www.kildare.ie/e-history/index.php/church-of-st-michael-and-all-angels-millicent-clane/</a> [Accessed 11 October 2021]</p> <p>Ordnance Survey 6",</p>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							<p>the church comprises a cruciform plan building, orientated east-west, with short transepts and a central square tower (visible for some distance), a projecting porch is located to the south. The lych gate comprises a four bay, rectangular covering to the shallow stepped entrance, with transverse gables, and a gate mid-way. It has a slate pitched roof with decorative ridge pieces and bargeboards. The lych gate appears to have been restored in March 2011.</p> <p>The church is set within a rectangular treelined graveyard with an established hedgerow bounding the L2002.</p>		<p>1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2019 [11 October 2021] Google StreetView 2011 [11 October 2021]</p>
AH_13	RPS B14-02	Protected Structure	Bodenstown	Kildare	Church and graveyard	689044 / 724811	<p>Bodenstown Medieval Church Ruins and Wolfe Tone's Grave</p> <p>A church and graveyard is depicted on historic mapping, adjacent to the road through Bodenstown to the west of the crossroads. The building is shown as a rectangular structure with a projecting porch to the west. Later mapping identified the church 'in ruins' and includes 'Wolfe Tone's Grave'. The building is depicted as three walls (north, west, and south) with a projecting bay to the south. The church is located within its associated enclosed graveyard (AY_31), south of the L2010. The structure comprises the ruinous western gable and sections of the north and south rubble stone elevations. The remains of the western porch also remain.</p>	Medieval	<p>Record of Protected Structures Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2009 [11 October 2021]</p>
AH_14	RPS B14-34	Protected Structure	Castlesize	Kildare	Gate lodge	688691 / 724806	<p>Gate Lodge and entrance gates/walls to east of Castlesize House</p> <p>A lodge is depicted on historic mapping as a small rectangular building to the north of the driveway to Castlesize House (B14-13). Later mapping identifies the building as a 'lodge'.</p> <p>A single storey rendered lodge, with slate roof, building located within the Castlesize demesne (DL_18). Positioned on the driveway to the main house, the lodge is set behind a high stone boundary wall to the north of the entrance</p>	Post-medieval	<p>Record of Protected Structures Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2018 [11 October 2021]</p>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							gates (off the R407), surrounded by mature trees and established vegetation.		
AH_15	RPS B14-27C	Protected Structure	Millicent Demesne	Kildare	House	687860 / 724793	<p>Square plan two-storey house with (later?) conservatory and outbuilding.</p> <p>Millicent Estate Houses</p> <p>Located within Millicent Demesne (DL_17), a small rectangular building is depicted on historic mapping to the north of the drive to Millicent House (B14-26), to the west of a small bridge crossing a minor watercourse. Later mapping depicts the building as having a projecting bay on the northern elevation and two small projecting porches, and identifies it as a 'lodge'.</p> <p>The building comprises a square plan, two-storey house with a conservatory and outbuilding, both possibly of a later date. The house is surrounded by established gardens and woodland to the south-east. The principal elevation of the house is to the south-east, across a private access track. Millicent Road to the west is screened by an established boundary hedge.</p>	Post-medieval	Record of Protected Structures Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2019 [11 October 2021]
AH_16	RPS (no reference)	Protected Structure	Jigginstown	Kildare	House	687993 / 718977	<p>Jigginstown Castle and Environs</p> <p>Detached red brick country house (in ruins) c1630</p> <p>A large rectangular building is depicted immediately to the south of the road through Jigginstown on historic mapping, with two smaller ranges to the west and 'Jigginstown House' to the south. Later mapping identified the castle as 'in ruins' and shows a tree-lined boundary between the building and the road. A sunken area is shown immediately to the south, and several other buildings are depicted in proximity.</p> <p>The castle is located immediately to the south of the R445. Local legend states men lined from Dublin to Naas and passed the bricks along the line to build the house, that there is gold buried beneath the house guarded by a black dog, and a tunnel leads from Jigginstown to Killashee.</p>	Post-medieval	Record of Protected Structures Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2019 [11 October 2021] <a href="https://digital.ucd.ie/view/media/duchas:4819384/canvas?manifest=https://data.ucd.ie/api/img/manifests/duchas:4819384">https://digital.ucd.ie/view/media/duchas:4819384/canvas?manifest=https://data.ucd.ie/api/img/manifests/duchas:4819384</a> [4 November



ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
									2021] <a href="https://digital.ucd.ie/view-media/duchas:4952388/canvas?manifest=https://data.ucd.ie/api/img/manifests/duchas:4952388">https://digital.ucd.ie/view-media/duchas:4952388/canvas?manifest=https://data.ucd.ie/api/img/manifests/duchas:4952388</a> [4 November 2021]
AH_17	RPS NS19-079	Protected Structure	Jigginstown	Kildare	Tower House (in ruins)	687866 / 718877	<p>Castle Rag</p> <p>Depicted on historic mapping as a small square in plan tower house identified as 'Castle Rag'. Later mapping identifies the castle 'in ruins'.</p> <p>Set within a rubble stone walled enclosure, the square tower is ruinous. It comprises a three storey tower house with small rectangular windows on the north-east elevation. Set back from the R445, the tower house is surrounded by grass fields with modern housing to the south, and Jigginstown Castle to the north-west.</p>	Post-medieval	Record of Protected Structures Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2019 [11 October 2021]
AH_18	RPS NS19-115	Protected Structure	Bluebell	Kildare	Farm house	688798 / 717262	<p>Bluebell Farm House</p> <p>Originally three-bay two-storey Victorian farm house</p> <p>The house is depicted on historic mapping as a rectangular range adjacent to the road between Bluebell and Broadfield. Later mapping shows a projecting bay to the east, and associated ranges to the south forming a yard.</p> <p>The house forms part of a working farmyard and is enclosed by a high rubblestone boundary wall. Views west are towards and across Kilcullen Road (both the former alignment and newer alignment); however, these are largely screened by the boundary wall.</p>	Post-medieval	Record of Protected Structures Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView 2017 [11 October 2021]

Table A3: Inventory of Gardens and Designed landscapes

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
DL_01	N/A	N/A	Mullagh	Meath	Garden and Designed Landscape		Glebe House Demesne associated with Glebe House ('Paget Priory' on 25" OS mapping). Mature trees, hedges and low stone boundary wall with cast iron railings mark the boundary with the R156 and R126. Roughcast and painted gate piers (3) on junction with R125 / R126, with cast iron gate, leading to drive as depicted on historic mapping.	Post-medieval	Google StreetView (2021) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
DL_02	N/A	N/A	Jeninstown	Meath	Garden and Designed Landscape		Jeninstown House Demesne associated with Jeninstown House. Mature trees and a ditch mark the boundary alongside the R156, a roughcast wall, with crenelated cope, square gate piers, and cast-iron gate are located at the entrance / drive.	Post-medieval	Google StreetView (2021) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
DL_03	NIAH 5151	N/A	Phepotstown	Meath	Garden and Designed Landscape		Phepotstown House Hedgerows and mature trees, roughcast walls and gate piers, with cast iron gates, leading onto drive / avenue. Wall continues along R125 with battened buttresses and unrendered sections. Mature woodland / hedges bound R125 until second entrance with sections of lower wall, cylindrical columns and decorative cast iron railings and gates onto drive.	Post-medieval	Google StreetView (2019 & 2021) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
DL_04	NIAH 5104	N/A	Phepotstown	Meath	Garden and Designed Landscape		Larch Hill House Buildings indicated, not named Established trees / hedgerows bound the R125, to gate entrance with lodge house (and additional ancillary building). Rendered walls and four square piers with cast iron gates which lead to a second set of piers beyond the lodge, along the drive. Low rubble stone wall runs from entrance to carriageway. Established boundary continues along R125, southern boundary established woodland belt. See also NIAH 14404905.	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/5104/larch-hill-house-kilmore-co-meath">https://www.buildingsofireland.ie/buildings-search/site/5104/larch-hill-house-kilmore-co-meath</a> Google StreetView (2019 & 2021) Ordnance Survey 6", 1837 – 1842

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
									Ordnance Survey 25", 1888-1913
DL_05	N/A	N/A	Rodanstown	Meath	Garden and Designed Landscape		Rodanstown House Boundary of this demesne is still perceptible; however, features including the woodland / boundary trees and 'L'-shaped range appear to have been removed. Modern agricultural buildings are located on the site with a range, positioned perpendicular to the road, still extant. Stone, roughcast and brick walls and low hedges bound the road, some of this boundary has been replaced with modern concrete blocks. Rendered gate piers and cast-iron gates lead onto drive to main house. Drive follows same alignment and garden wall remains extant.	Post-medieval	Ordnance Survey 6", 1837 – 1842
DL_06	NIAH 5697	N/A	Calgath	Meath	Garden and Designed Landscape		Calgath House A significant number of modern agricultural buildings have been constructed on this site. Mature trees / low hedges to large roughly coursed rubblestone entrance wall / piers, iron gates with modern lanterns atop gate piers, leading to driveway. Along R125 wall replaced by a modern wooden fence, then continues as hedgerow.	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/5697/calgath-house-co-meath">https://www.buildingsofireland.ie/buildings-search/site/5697/calgath-house-co-meath</a> Google StreetView (2019 & 2021) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
DL_07	NIAH 4983	N/A	Calgath	Meath	Garden and Designed Landscape		Brides Stream House Buildings indicated, not named Rendered entrance walls and gate piers, metal gate (modern replacement). Entrance appears to have been made narrower. R126 bounded by a low stone wall and ditch, with mature hedge / tree line. Southern entrance of bend in R125 comprises a semi-circular recessed entrance, with rendered stone wall, cast iron railings and cylindrical gate piers with cast iron gates. Driveway appears to be overgrown / disused. Second entrance comprises a rendered stone wall bounding the carriageway with a	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/4983/brides-stream-house-rodanstown-co-meath#">https://www.buildingsofireland.ie/buildings-search/site/4983/brides-stream-house-rodanstown-co-meath#</a> Google StreetView (2019 & 2021) Ordnance Survey 6", 1837 – 1842

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							recessed cast iron gate and square gatepiers. Wall continues along the R125 a short distance with two square piers towards the centre. Entrances either side of the lodge. Walling of the same character appears to run perpendicular to the southern entrance, along the edge of the demesne land.		Ordnance Survey 25", 1888-1913
DL_08	NIAH 5556	N/A	Dollardstown	Kildare	Garden and Designed Landscape		Dollardstown House Possibly wrong location.	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/5556/dollardstown-house-co-kildare">https://www.buildingsofireland.ie/buildings-search/site/5556/dollardstown-house-co-kildare</a>
DL_09	NIAH 1911	N/A	Dowdstown	Kildare	Garden and Designed Landscape		Dowdstown House Principal building remains extant; however, this demesne has been largely redeveloped.	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/1911/dowdstown-house-laraghbryan-co-kildare">https://www.buildingsofireland.ie/buildings-search/site/1911/dowdstown-house-laraghbryan-co-kildare</a>
DL_10	NIAH 1884	N/A	Painestown	Kildare	Garden and Designed Landscape		Painestown House Buildings indicated, area to west labelled Painestown. Fair amount of woodland from historic OS mapping no longer present. R407 bounded by established hedgerow and mature trees. Pair of small gatepiers and cast-iron gate, recessed from carriageway, leading on to driveway. Hedgerow continues and is replaced by a post and rail fence, with mature trees lining the carriageway. Later entrance further south.	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/1884/painestown-house-balraheen-co-kildare">https://www.buildingsofireland.ie/buildings-search/site/1884/painestown-house-balraheen-co-kildare</a> Google StreetView (2019 & 2021) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
DL_11	NIAH 1894	N/A	Rathcoffey Demesne	Kildare	Garden and Designed Landscape		Rathcoffey House Principal building remains; however, is ruinous. Boundary of demesne still perceptible; however, the area is largely agricultural, and fields have been consolidated. Round tree-topped earthwork feature still extant. Historic divisions (i.e. garden boundary, field divisions) visible as	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/1894/rathcoffey-house-balraheen-co-kildare">https://www.buildingsofireland.ie/buildings-search/site/1894/rathcoffey-house-balraheen-co-kildare</a>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							cropmarks on aerial photographs. Drive off School Road still on same alignment, with stone entrance walls / gate piers (modern gate).		
DL_12	NIAH 1900	N/A	Ladycastle Lower; Irishtown Lower	Kildare	Garden and Designed Landscape		Irishtown House Principal building remains extant; however, a large portion of this demesne has been redeveloped into a golf course. Local access follows alignment of drive on historic mapping. A circular pigeon house is depicted on historic mapping, and remains extant to the west of the main house. Fields have been consolidated and trees removed. Some boundaries and avenues still perceptible. Includes an area of Ladycastle Lower, also much changed.	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/1900/irishtown-house-straftan-co-kildare">https://www.buildingsofireland.ie/buildings-search/site/1900/irishtown-house-straftan-co-kildare</a> Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
DL_13	N/A	N/A	Ladycastle Upper	Kildare	Garden and Designed Landscape		Ladycastle Large area of parkland depicted on historic mapping, south of the River Liffey. However, largely redeveloped as a golf course.	Post-medieval	Ordnance Survey 6", 1837 – 1842
DL_14	NIAH 1882	N/A	Firmount Demesne	Kildare	Garden and Designed Landscape		Firmount House Building indicated, area to north east labelled Firmount East Rendered wall with flat cope immediately adjacent to the L2002, includes small doorway towards north. Modern entrance has been added to north corner as access to new house. Small square building in south-east corner of walled garden (possible gazebo / dovecote). Later entrance also added to south of walled garden (although not replacing a section of the wall as above), leads to tree-lined avenue. L2002 bounded by modern post and rail fence, ditch and tree line. Second entrance completely replaced, with third and forth brick and stone entrances to modern housing. Hedgerow continues.	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/1882/firmount-house-clane-co-kildare">https://www.buildingsofireland.ie/buildings-search/site/1882/firmount-house-clane-co-kildare</a> Google StreetView (2019 & 2021) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
DL_15	NIAH 1883	N/A	Firmount East	Kildare	Garden and		Moatfield House Building indicated, not named Modern entrance in west corner. Ditch and established	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/1883/moat">https://www.buildingsofireland.ie/buildings-search/site/1883/moat</a>

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
					Designed Landscape		hedgerow bound the L2002. Two new entrances (including post and rail fencing). Field entrance in same location as historic OS mapping (modern gate, possibly older posts). Recessed stone entrance, rubble stone wall with simple square gate piers and metal gates, drive leads up to house (B14-18) - wide tree-lined avenue. Lodge no longer extant. Low established hedge continues along L2002.		<a href="#">field-house-clane-co-kildare</a> Google StreetView (2019 & 2021) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
DL_16	NIAH 1890	N/A	Blackhall	Kildare	Garden and Designed Landscape		Blackhall Main house and agricultural ranges remain extant. Layout of gardens and areas of trees / woodland also remain. Some subdivision of parkland and development; however, drives and belts of trees along boundary with R407 remain. Later ashlar entrance / gate piers adjacent to lodge. Entrance to main house set back from R407.	Post-medieval	Ordnance Survey 6", 1837 – 1842
DL_17	NIAH 1889	N/A	Millicent Demesne	Kildare	Garden and Designed Landscape		Millicent House Woodland and established hedgerow adjacent to carriageway leading to lych gate for church. Hedgerow continues with intermittent field accesses and mature trees, more recent accesses to properties, including section of rendered wall. Modern post and rail fence continues after housing, with a ditch and mature trees adjacent to road. Modern farm entrance on bend (roughcast single storey building depicted on historic OS (25") mapping. Hedgerow and ditch continue along road following farmyard, with sections of mature trees. Following Blundell's Bridge trees and hedge thin / have been removed. Ditch, hedgerows and trees continue beyond new house, however, are replaced by low privet and modern entrances and post and rail fencing further along Millicent Road. Large extant lodge, with rubble stone wall lined entrance and drive up to main house. Rubble stone wall continues along carriageway, some sections showing signs of repair. Replaced by post and rail fence for a section. Wall continues to entrance with second extant	Post-medieval	Google StreetView (2019 & 2021) Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							lodge, includes square ashlar gate piers and cast-iron gates, with drive leading to main house. Rubble stone wall continues from entrance, lining both sides of carriageway, to Millicent Bridge.		
DL_18	NIAH 1893	N/A	Castlesize	Kildare	Garden and Designed Landscape		Castlesize Some internal change; however, buildings and layout generally the same as depicted on historic mapping. Entrance opposite junction between the R407 and Castlesize Green includes entrance walls, gate piers, and cast-iron gates. Roughcast, with possible later sections. Boundary wall adjacent to R407 rubblestone construction with alternate vertical and horizontal copes, and second entrance, leading on to disused drive.	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/1893/castlesize-bodenstown-co-kildare">https://www.buildingsofireland.ie/buildings-search/site/1893/castlesize-bodenstown-co-kildare</a> Ordnance Survey 6", 1837 – 1842
DL_19	NIAH 1887	N/A	Osberstown	Kildare	Garden and Designed Landscape		Osberstown Hill Principal building and some agricultural ranges to the south remain extant. Largely the same layout as depicted on historic mapping; however, majority of parkland trees appear to have been removed. Roadside boundary is a modern post and rail fence. Driveway slightly altered (matches Ordnance Survey 25").	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/1887/osberstown-hill-naas-co-kildare">https://www.buildingsofireland.ie/buildings-search/site/1887/osberstown-hill-naas-co-kildare</a> Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
DL_20	NIAH 1980	N/A	Killashee	Kildare	Garden and Designed Landscape		Killashee House Buildings indicated, labelled School, area labelled Killashee. R448 cuts through western limit of demesne land until Killashee School. Boundary established hedgerows and ditch, with field accesses and post and rail sections (modern). A section of roughly coursed rubble stone wall to south of demesne, with later recessed entrance on junction with local access.	Post-medieval	<a href="https://www.buildingsofireland.ie/buildings-search/site/1980/killashee-house-killashee-co-kildare#">https://www.buildingsofireland.ie/buildings-search/site/1980/killashee-house-killashee-co-kildare#</a>



Table A4: Inventory of Cultural heritage sites

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
CH_01	N/A	N/A	Culcommon	Meath	Road Bridge	694713 / 746280	The western coursed, squared, rubble stone parapet of a road bridge or culvert carrying a single lane carriageway over a small watercourse depicted on historic mapping. Half-round copes, rendered. Only one side (west) remains extant.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_02	N/A	N/A	Warrenstown	Meath	House	691765 / 745557	'Jenkinstown House' depicted on historic mapping comprising the main house and a long range to north (other buildings appear to have been replaced). Two-storey, three bay house, with gable stacks, rendered. Later extension added to north gable (one and a half storey). Agricultural range and walled yard appear to remain extant. Principal elevation of house is south-east facing, towards the R156; however, this is screened by a belt of established trees and vegetation.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_03	N/A	N/A	Jenkinstown	Meath	Public House	693262 / 745438	A public house depicted on historic mapping comprising a one and a half storey, roughcast immediately adjacent to the R156. Remains of a possibly earlier single storey range to south-east, now with corrugated roof, depicted on 6" OS mapping (without P.H.). One and a half storey roughcast building with two stacks and dormer windows. Modern single, storey additions, including a porch and entrance. Rendered wall adjacent to the carriageway (R156). Overlooks the R156.	Late 19th - early 20th century	Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_04	N/A	N/A	Jenkinstown	Meath	Road Bridge	691671 / 745333	A low rubble stone bridge that carries the R156 across a small watercourse. Depicted on historic mapping as 'Jenkinstown Bridge'. Low rubble stone parapets with wingwalls to east and north. Modern concrete wall added to south-east end of southern parapet.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_05	N/A	N/A	Phepotstown	Meath	House	689469 / 744597	'Phepotstown House' depicted on historic mapping comprising a farmhouse with an attached long range and	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							ancillary buildings. Principal elevation of farmhouse towards the R125 to the north.		various [07 November 2021]
CH_06	N/A	N/A	Martinstown	Meath	Road Bridge	689725 / 743478	A stone road bridge depicted on historic mapping comprising two low parapets with alternate horizontal and vertical copes on the R125. Roughly coursed masonry. Narrow footway along the inside of the south-western parapet. Some damage.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_07	N/A	N/A	Phepotstown; Calgath	Meath	Road Bridge	689372 / 743057	A stone road bridge depicted on historic mapping comprising two low stone parapets with rough vertical copes on the R125. Roughly coursed masonry.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_08	N/A	N/A	Rodanstown	Meath	Mill Dam	690331 / 742110	'Old Mill Dam' depicted on historic mapping, north of Rodanstown House. Located within two undeveloped agricultural fields adjacent to the road, no features associated with the mill were visible on aerial imagery.	Post-medieval	Ordnance Survey 6", 1837 – 1842
CH_09	N/A	N/A	Dolanstown	Meath	Lodge	690365 / 741843	A small single storey lodge building depicted on historic mapping and associated with Bridestream House. Located within an overgrown plot adjacent to entrance to the demesne (DL_07) with a farm entrance to south. Associated with Bridestream House.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_10	N/A	N/A	Dolanstown	Meath	Farm	689017 / 740938	A farm depicted on depicted on historic mapping. While some ranges remain extant, the complex has largely been replaced by more recent agricultural buildings.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							Rodanstown House - farm, some ranges still extant as depicted.		various [07 November 2021]
CH_11	N/A	N/A	Balfeaghan	Meath	House	689025 / 740886	A rendered two-storey, rendered with quoins, three bay, house depicted on historic mapping, with low walled garden to north. A number of modern farm buildings and sheds are located to the south-east, and the house is largely screened from the R158 (approximately 20m to the west).	Late 19th - early 20th century	Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_12	N/A	N/A	Balfeaghan; Boycetown	Meath; Kildare	Road Bridge	688018 / 740642	'Balfeaghan Bridge', depicted on historic mapping, carries the R158 across the River Rye and the Meath-Kildare county boundary. The bridge comprises a slightly humped stone structure with parallel parapets and vertical roughly hewn copes. Coursed rubble stone construction, some modern alterations.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_13	N/A	N/A	Moyglare	Meath	Police Station	692931 / 739788	A police station depicted on historic mapping and identified on later mapping as a 'constabulary barracks'. Located immediately to the north of Moyglare Road, overlooking the roadway.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_14	N/A	N/A	Commons West	Kildare	Racecourse	692931 / 739788	The site of Commons West racecourse depicted on historic mapping as a sub-circular circuit with some small buildings to the south. The form of the racecourse remains perceptible however, some modern development has occurred.	Post-medieval	Ordnance Survey 6", 1837 – 1842
CH_15	N/A	N/A	Commons South	Kildare	House	687572 / 739143	A small single storey vernacular building with a corrugated metal roof, with gable and central stacks. Depicted on historic mapping. Located within an overgrown roadside plot on the R407 and L5028.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
CH_16	N/A	N/A	Courtown Great	Kildare	Lodge	687151 / 738719	A single storey rendered lodge with two stacks and slate gabled roof. Adjacent to a lane leading to Courtown House. The lodge is depicted on historic mapping. Positioned adjacent to the lane, perpendicular to the R407.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_17	N/A	N/A	Portgloriam	Kildare	Agricultural building	686497 / 738292	An agricultural range depicted on historic mapping; later mapping identified the building as 'The Mount'. Positioned at an angle to the R407, away from the road, amongst a group of later agricultural buildings.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_18	N/A	N/A	Laraghbryan East	Kildare	Earthworks	692330 / 737877	Linear banks and ditches in a field to the north of Kilcock Road, identified from historic aerial photographs. Possibly associated with AY_10, or a nearby ecclesiastical site (KD005-021).	Unknown	<a href="https://www.cambridgeairphotos.com/location/ape008/">https://www.cambridgeairphotos.com/location/ape008/</a> [Accessed 07.11.21].
CH_19	N/A	N/A	Laraghbryan East	Kildare	Bridge	691947 / 737649	A possible bridge or crossing point over the River Lyreen depicted on historic mapping. No corresponding features are visible on modern aerial imagery.	Unknown	Ordnance Survey 6", 1837 – 1842
CH_20	N/A	N/A	Newtown	Kildare	Farm	692218 / 736772	A farm depicted on historic mapping. The current layout reflects that depicted on later mapping. Located west of Rathcoffey Road, and immediately to the north of the M4 motorway.	Late 19th - early 20th century	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
CH_21	N/A	N/A	Crinstown	Kildare	Farm	691258 / 736597	A farm complex depicted on historic mapping, only the farmhouse remains extant. Only farmhouse remains extant. Comprises a three bay, two storey structure with gable stacks. Modern single storey porch.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_22	N/A	N/A	Donaghstown	Kildare	Bridge	691777 / 734898	A possible bridge or historic crossing over an unnamed watercourse depicted on historic mapping.	Post-medieval	Ordnance Survey 6", 1837 – 1842
CH_23	N/A	N/A	Donaghstown	Kildare	Building	691783 / 734648	A small rectangular building depicted on historic mapping. Positioned adjacent to the L5037. The plot is now densely wooded.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_24	N/A	N/A	Baltracey	Kildare	Road Bridge	687121 / 733948	A road bridge depicted on historic mapping. Crosses Baltracey River, carries R407. Squared rubble stone structure with parallel parapets with squared blocks as copes. Roughly coursed masonry construction. Overgrown.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_25	N/A	N/A	Bryanstown	Kildare	Enclosure	691356 / 733724	A series of cropmarks in an agricultural field identified from aerial imagery. Features include a small possible rectilinear enclosure near the eastern field boundary and two possible pits. No corresponding features were identified on historic mapping.	Unknown	EirGrid Ortho imagery
CH_26	N/A	N/A	Graiguesallagh	Kildare	Farm	689693 / 733526	A farm complex depicted on historic mapping. Current layout reflects the layout depicted on later mapping. Square plan house with long 'L'-shaped range to south/south-west. Single storey rubble stone house with later pitched porch, dormer windows. Slate roof with central brick stack. Decorative wooden boards below eaves. Part of range replaced with modern concrete building. Similar stone construction / slate roofs. Modern store to	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							south. A boundary wall of similar stone, rubble construction is located adjacent to the R408.		
CH_27	N/A	N/A	Smithstown	Kildare	Building	690854 / 733168	Farm buildings depicted on historic mapping. Two ranges remain extant, incorporated into other buildings, with later buildings forming part of the complex. Set back from a local road.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_28	N/A	N/A	Rathcoffey North	Kildare	House	689117 / 732739	A house depicted on historic mapping, with possible associated range to west (roadside). Later house located immediately to the south. Positioned adjacent to the R408 and L5046. Overgrown screening towards Proposed Development.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_29	N/A	N/A	Windgates	Kildare	House	692955 / 732635	A house depicted on historic mapping. Located to the east of the R406. Views across the carriageway towards arable fields. Modern farm buildings are located to the east and south.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_30	N/A	N/A	Rathcoffey North	Kildare	House	688156 / 732339	Roadside building, immediately overlooking R408. Depicted on historic mapping. Four bay, two storey house with single storey later extension to western gable. Rough cast central stack, with slate roof. Rubble stone construction. Two perpendicular ranges - demolished and new bungalows. Surrounding boundary wall of similar material. Later / modern rendering to principal facade / 1/2 rendered eastern gable.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_31	N/A	N/A	Rathcoffey South	Kildare	House	688190 / 732277	A five bay, two storey house with hipped roof and central stack depicted on historic mapping. Located off the L50351.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
									various [07 November 2021]
CH_32	N/A	N/A	Johninstown	Kildare	Building	690510 / 731928	A small rectangular building, possibly an agricultural range, depicted on historic mapping adjacent to the L5046.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_33	N/A	N/A	Barberstown Lower	Kildare	Field boundaries	693077 / 731907	Linear and curvilinear cropmarks identified from aerial imagery. Some of these features correspond with historic field boundaries depicted on historic mapping. In agricultural fields immediately adjacent to the R406.	Post-medieval	Ordnance Survey 6", 1837 – 1842
CH_34	N/A	N/A	Barberstown Upper	Kildare	House	692707 / 731744	A house depicted on historic mapping. Located to the west of the R406, views are across the carriageway towards arable fields. A gravel pit is located to the north.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_35	N/A	N/A	Barberstown	Kildare	Field boundaries	693259 / 731148	Linear cropmarks identified from aerial imagery that correspond to field boundaries on historic mapping. In agricultural fields immediately adjacent to the junction between the R406 and R403. In the same field as KD010-027.	Post-medieval	Ordnance Survey 6", 1837 – 1842
CH_36	N/A	N/A	Barberstown; Staffan; Bawnoges	Kildare	Field boundaries	692346 / 730958	Linear cropmarks identified from aerial imagery including some which correspond with field boundaries depicted on historic mapping. Located near a cluster of SMR features which may comprise a barrow cemetery (including AY_21 and AY_22). In a field immediately to the south of the R403.	Post-medieval	Ordnance Survey 6", 1837 – 1842



ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
CH_37	N/A	N/A	Betaghstown	Kildare	House	685351 / 729626	A house on Betaghstown Cross Roads, depicted on historic mapping. Comprises a rendered two storey house, with single storey attached range and later additions. A low rendered boundary wall runs along the R408 and L1023.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_38	N/A	N/A	Richardstown	Kildare	House	688543 / 728782	House depicted on historic mapping. Set in agricultural land, with a clump of established trees to the immediate south-east. Set back from the R403.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_39	N/A	N/A	Firmount West	Kildare	Farm	685606 / 727306	Farm complex on Firmount Cross Roads depicted on historic mapping. Arranged in courtyard plan with later buildings and additions. The main house faces onto the R403, with the junction with the L2002 and a local road adjacent.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_40	N/A	N/A	Blackhall	Kildare	Field System	688493 / 727099	Linear and curvilinear cropmarks identified on aerial imagery to the south of the River Liffey. Interpreted as possible enclosures or a field system. No corresponding features were identified on historic mapping.	Unknown	
CH_41	N/A	N/A	Firmount West	Kildare	Field barn	685720 / 727075	Single storey field barn rendered with corrugated gable roof. Perpendicular to the L2002.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
CH_42	N/A	N/A	Firmount West	Kildare	Outbuilding	685788 / 726882	Single storey outbuilding depicted on historic mapping. Stone and rendered. Partially missing roof.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_43	N/A	N/A	Firmount Demesne	Kildare	House	685934 / 726668	A single storey roughcast house, with porch and central stack, slate roof, depicted on historic mapping. Later extensions / additions. Low stone boundary wall, rough cast with horizontal slab cope, two sets of gate piers, bounds the L2002.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_44	N/A	N/A	Littlerath	Kildare	Water feature	689320 / 726235	Sub-circular body of water with a small square building depicted on historic mapping. Later mapping identified the areas as a disused quarry. Immediately to the west of the L6003.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
CH_45	N/A	N/A	Blackall	Kildare	Lodge	688212 / 726113	A lodge depicted on historic mapping. On the R407 at the treelined driveway to the Blackhall GDL (DL_16).	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_46	N/A	N/A	Millicent South	Kildare	House	687359 / 725731	A house depicted on historic mapping, as a 'Vicarage'. Likely associated with Millicent Church and Lych Gate (AH_12). Single storey ranges, parallel to the north of a brick with first floor rendered house. Roadside range has a central brick stack, and gabled roof, of slate. The church tower is glimpsed from plot; however, otherwise the house	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]

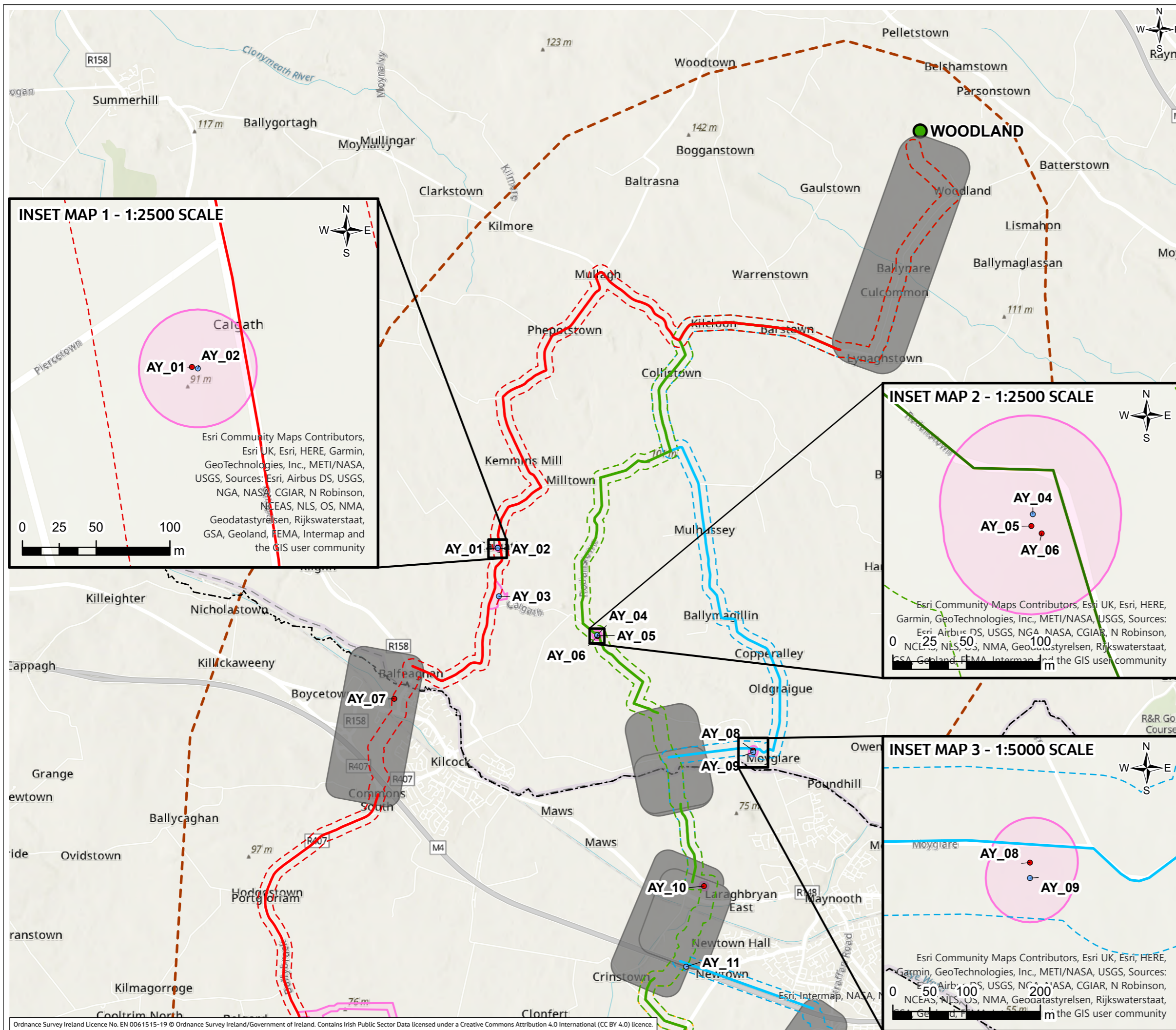
ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							is largely screened by established trees and vegetation. The existing road already separates the house and church.		
CH_47	N/A	N/A	Ladyhill	Kildare	House	689213 / 725435	Two ranges depicted on historic mapping. Appear to have been incorporated into later house. Detached ranges no longer extant. Set back from the L6003.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_48	N/A	N/A	Blackhall	Kildare	Farm	688707 / 724866	A roadside farm complex depicted on historic mapping. Located adjacent to the R407.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_49	N/A	N/A	Bodenstown	Kildare	House	689127 / 724824	A small square roadside building depicted on historic mapping. 'L'-shaped range with another range further south. Identified as 'Bodenstown Cottage' on later mapping, depicted as a large building with two smaller rectangular ranges to the west. On the L2010.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913 Google StreetView various [07 November 2021]
CH_50	N/A	N/A	Johninstown	Kildare	Watch Tower	688567 / 724291	A watch tower depicted on historic mapping 'in ruins'. Not on First Edition Ordnance Survey mapping. Located in agricultural fields. Not visible on aerial imagery.	Late 19th - early 20th century	Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913
CH_51	N/A	N/A	Jigginstown	Kildare	Aqueduct	688232 / 719268	'Aqueduct' on historic mapping forming part of the Grand Canal.	Post-medieval	Ordnance Survey 6", 1837 – 1842
CH_52	N/A	N/A	Jigginstown	Kildare	Field boundaries	687422 / 718375	A linear feature comprising two, roughly parallel linears and smaller rectangular feature and possible cultivation marks identified from aerial imagery. Corresponds roughly to a field boundary on historic mapping, but not later mapping. Possibly a trackway. Field to the north includes a north-south linear and a circular feature north of the	Post-medieval	EirGrid Ortho imagery Ordnance Survey 6", 1837 – 1842 Ordnance Survey 25", 1888-1913

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							existing field boundary - no corresponding features on historic mapping.		
CH_53	N/A	N/A	Jigginstown	Kildare	Field boundaries	687650 / 718026	Linear cropmark interpreted as a former field boundary and perpendicular linear features interpreted as possible cultivation marks, identified from aerial imagery. Corresponds with a field boundary depicted on historic mapping.	Post-medieval	Ordnance Survey 6", 1837 – 1842
CH_54	N/A	N/A	Rathasker	Kildare	House	688148 / 717337	Small house depicted on historic mapping. On Rathasker Road.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_55	N/A	N/A	Killashee	Kildare	House	688073 / 716071	A house depicted on historic mapping. Six bay, one and a half storey rendered building, with gabled roof and stacks (gables and centre).	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_56	N/A	N/A	Oldtown	Kildare	Farm	687962 / 715565	Courtyard layout farm depicted on historic mapping with later ranges to the west. Two storey farmhouse, with gabled roof, gable stacks, and two-storey central wing. Single storey ranges and a stone roadside wall along the R448.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_57	N/A	N/A	Mylerstown	Kildare	House	687884 / 714478	A single storey cottage depicted on historic mapping with later additions. Three stacks (one later), slate roof, and gabled porch. Roadside location overlooking the R448.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]
CH_58	N/A	N/A	Stephenstown South	Kildare	House	687418 / 713423	Single storey half-thatched cottage, with high pitched roof. Depicted on historic mapping, including attached range which appears to have been removed (attached wall and return still extent). Subject to later additions and	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView

ID	Reference Number(s)	Legal Status	Townland	County	Site Type	Easting / Northing	Description	Date	Sources
							modification (double pile (later addition to south-west) with slate roof). Roadside location, with views across junction between R412, and R448.		various [07 November 2021]
CH_59	N/A	N/A	Stephenstown South	Kildare	House	687356 / 713137	A two-storey 'L'-shaped house depicted on historic mapping. Positioned on the R412.	Post-medieval	Ordnance Survey 6", 1837 – 1842 Google StreetView various [07 November 2021]



**FIGURE B.1.1**



**Legend**

- Study Area
- County Boundary
- 400kV Substation
- Proposed Cable Route - Option A (Red)
- Proposed Cable Route - Option B (Green)
- Proposed Cable Route - Option C (Orange)
- Proposed Cable Route - Option D (Blue)
- Off-Road Options Being Explored
- Cable Route Option A 100m Buffer
- Cable Route Option B 100m Buffer
- Cable Route Option C 100m Buffer
- Cable Route Option D 100m Buffer
- National Monument
- Preservation Order
- Recorded Monument
- Sites and Monuments Record (SMR)
- SMR Zone of Notification

0	Nov 2021	Draft issue	GB	GG	HC	FL
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

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Client

Project

EirGrid Kildare-Meath Grid Upgrade

Drawing Title

Locations of Archaeological Monuments Within 100m of Option A (Red), Option B (Green), Option C (Orange) and Option D (Blue) (Sheet 1 of 3)

Drawing Status

DRAFT

Scale @ A3

1:50,000

DO NOT SCALE

Jacobs No.

321084AH

Client No.

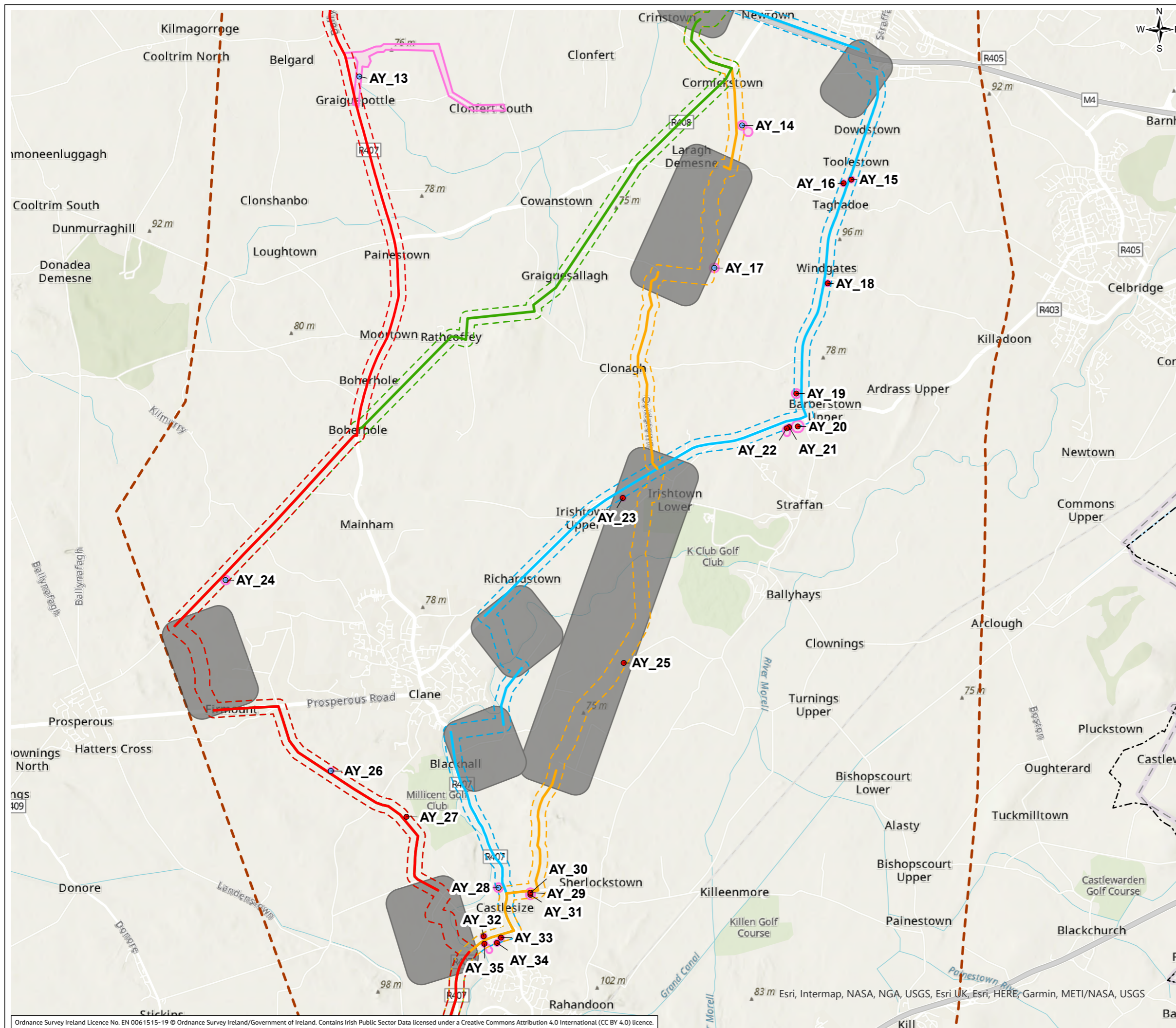
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321084AH-MAP-S4A-B.1.1

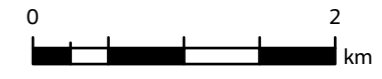
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**FIGURE B.1.1**



- Legend**
- Study Area
  - County Boundary
  - 400kV Substation
  - Proposed Cable Route - Option A (Red)
  - Proposed Cable Route - Option B (Green)
  - Proposed Cable Route - Option C (Orange)
  - Proposed Cable Route - Option D (Blue)
  - Off-Road Options Being Explored
  - Cable Route Option A 100m Buffer
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Client: EirGrid Kildare-Meath Grid Upgrade

Project: EirGrid Kildare-Meath Grid Upgrade

Drawing Title: Locations of Archaeological Monuments Within 100m of Option A (Red), Option B (Green), Option C (Orange) and Option D (Blue) (Sheet 2 of 3)

Drawing Status: DRAFT

Scale @ A3: 1:50,000 DO NOT SCALE  
Jacobs No.: 321084AH  
Client No.:

Drawing No.: 321084AH-MAP-S4A-B.1.1

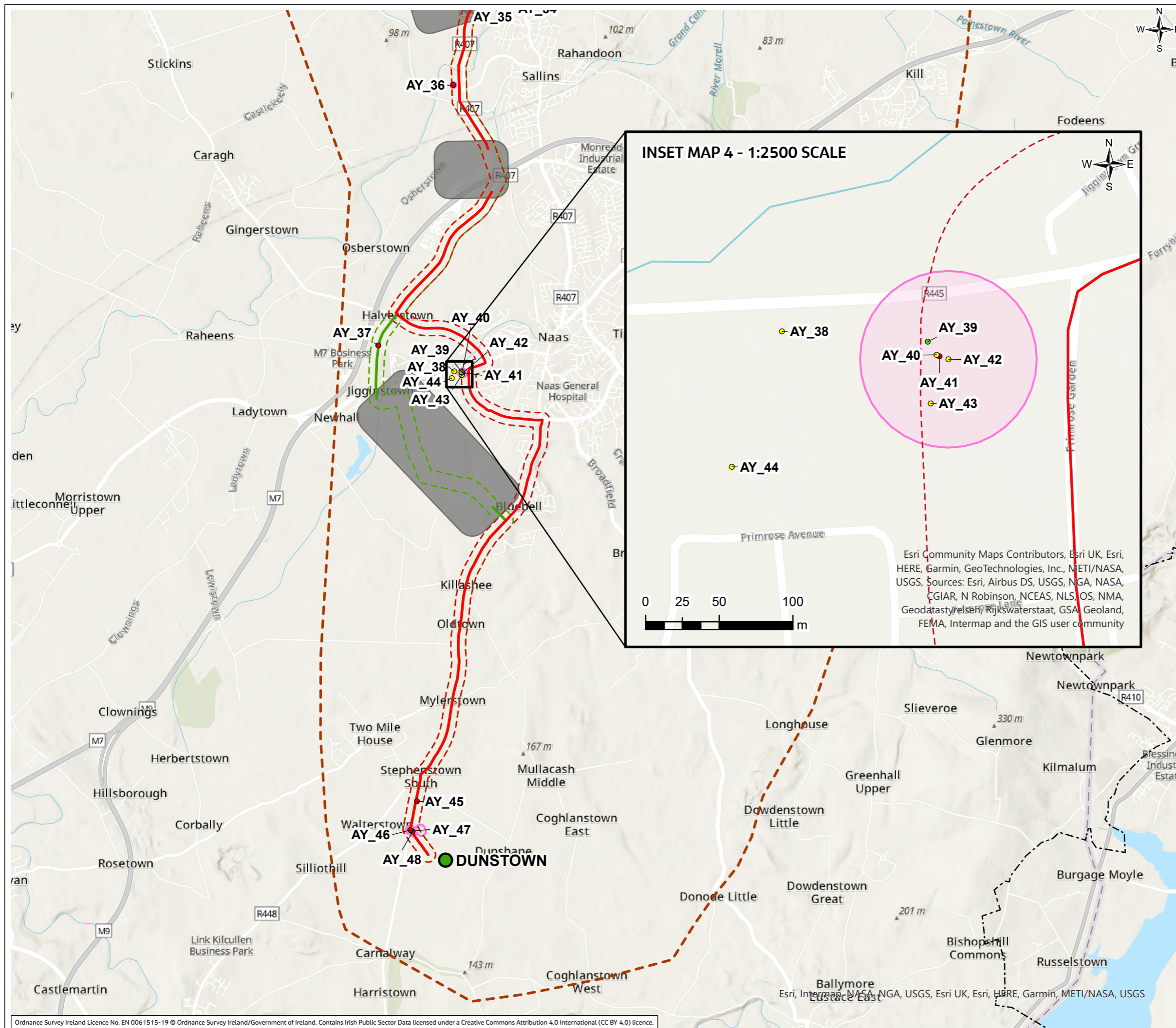
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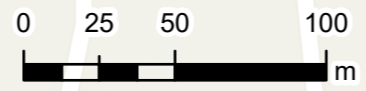
**FIGURE B.1.1**

**Legend**

- Study Area
- County Boundary
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- SMR Zone of Notification



**INSET MAP 4 - 1:2500 SCALE**



Esri, Garmin, GeoTechnologies, Inc., METI/NASA, USGS, Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

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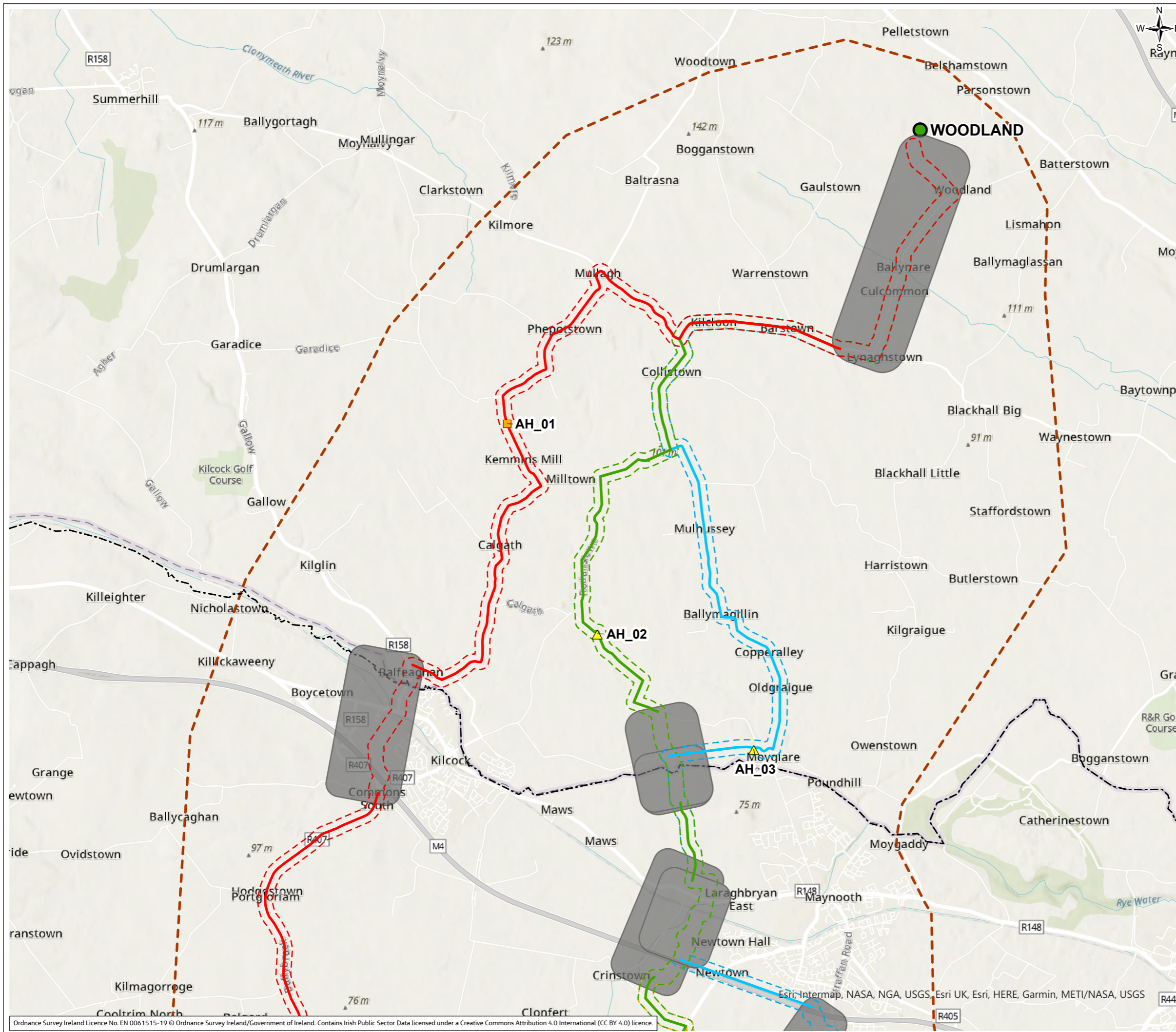


Client	<b>EIRGRID</b>					
Project	EirGrid Kildare-Meath Grid Upgrade					
Drawing Title	Locations of Archaeological Monuments Within 100m of Option A (Red), Option B (Green), Option C (Orange) and Option D (Blue) (Sheet 3 of 3)					
Drawing Status	DRAFT					
Scale @ A3	1:50,000	DO NOT SCALE				
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Drawing No.	321084AH-MAP-S4A-B.1.1					

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**FIGURE B.1.2**



**Legend**

- Study Area
- County Boundary
- 400kV Substation
- Proposed Cable Route - Option A (Red)
- Proposed Cable Route - Option B (Green)
- Proposed Cable Route - Option C (Orange)
- Proposed Cable Route - Option D (Blue)
- Off-Road Options Being Explored
- Cable Route Option A 100m Buffer
- Cable Route Option B 100m Buffer
- Cable Route Option C 100m Buffer
- Cable Route Option D 100m Buffer
- National Inventory of Architectural Heritage (NIAH) - Regional
- Record of Protected Structures (RPS)



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Project

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Drawing Title

Locations of Architectural Heritage Within 100m of Option A (Red), Option B (Green), Option C (Orange) and Option D (Blue)

Drawing Status

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Client No.

Drawing No.

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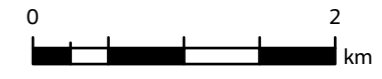
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**FIGURE B.1.2**

**Legend**

- Study Area
- County Boundary
- 400kV Substation
- Proposed Cable Route - Option A (Red)
- Proposed Cable Route - Option B (Green)
- Proposed Cable Route - Option C (Orange)
- Proposed Cable Route - Option D (Blue)
- Off-Road Options Being Explored
- Cable Route Option A 100m Buffer
- Cable Route Option B 100m Buffer
- Cable Route Option C 100m Buffer
- Cable Route Option D 100m Buffer
- ▲ Record of Protected Structures (RPS)



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Project  
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Drawing Title  
Locations of Architectural Heritage  
Within 100m of Option A (Red), Option B (Green),  
Option C (Orange) and Option D (Blue)

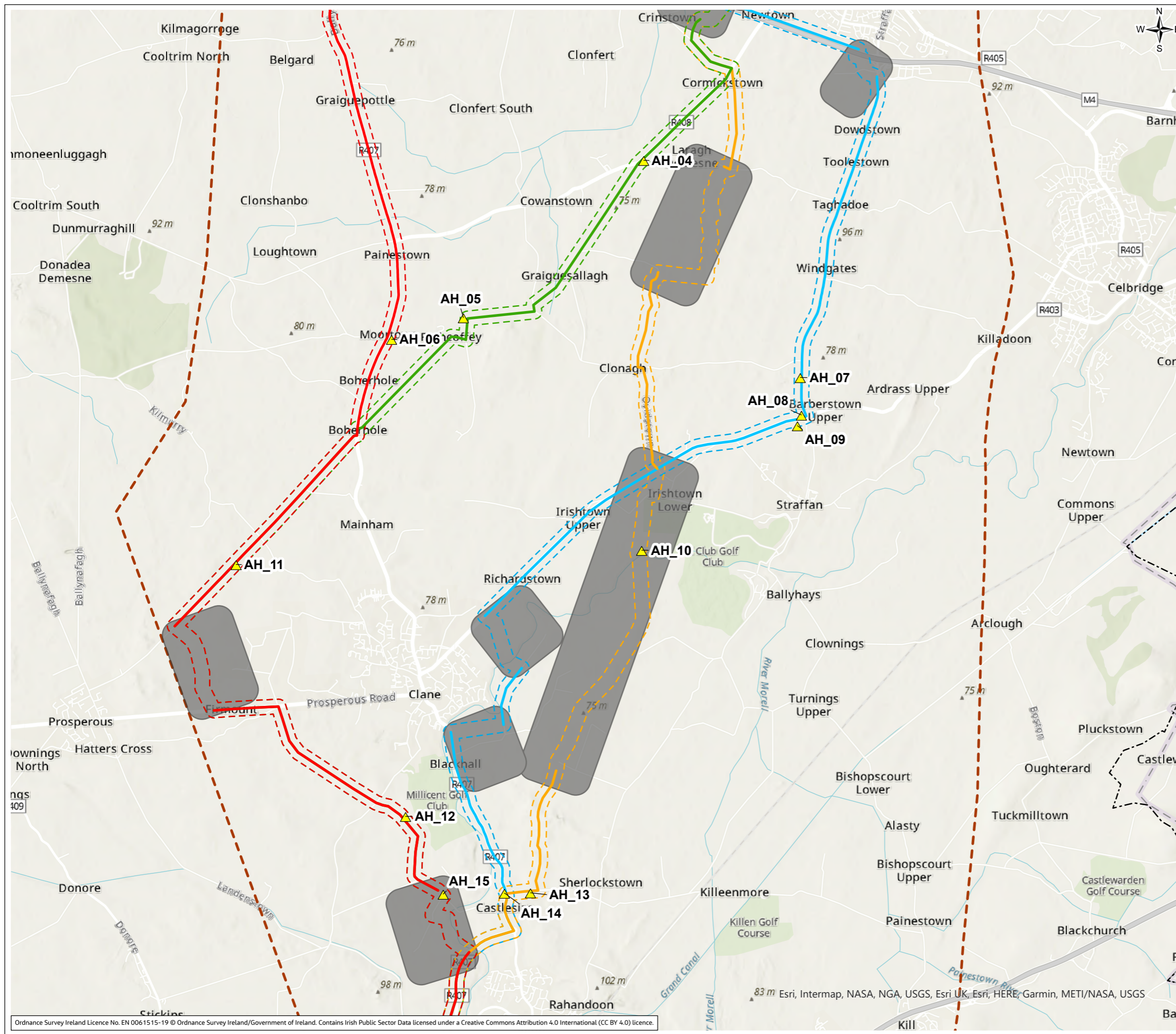
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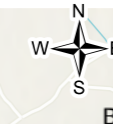
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**FIGURE B.1.2**

**Legend**

- Study Area
- County Boundary
- 400kV Substation
- Proposed Cable Route - Option A (Red)
- Proposed Cable Route - Option B (Green)
- Proposed Cable Route - Option C (Orange)
- Proposed Cable Route - Option D (Blue)
- Off-Road Options Being Explored
- Cable Route Option A 100m Buffer
- Cable Route Option B 100m Buffer
- Cable Route Option C 100m Buffer
- Cable Route Option D 100m Buffer
- ▲ Record of Protected Structures (RPS)



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Drawing Title: Locations of Architectural Heritage Within 100m of Option A (Red), Option B (Green), Option C (Orange) and Option D (Blue)

Drawing Status: DRAFT

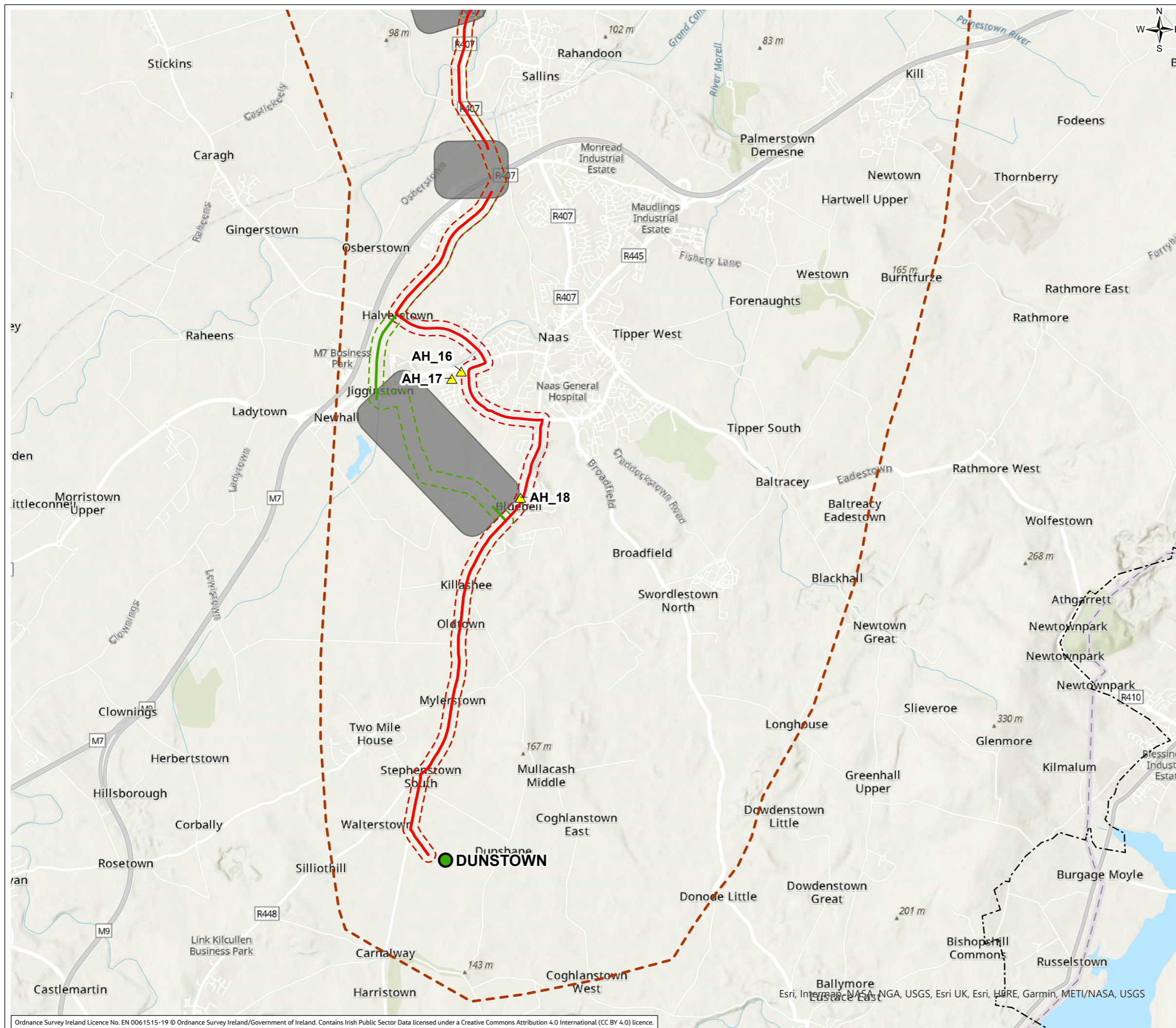
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Jacobs No.: 321084AH

Client No.:

Drawing No.: 321084AH-MAP-S4A-B.1.2

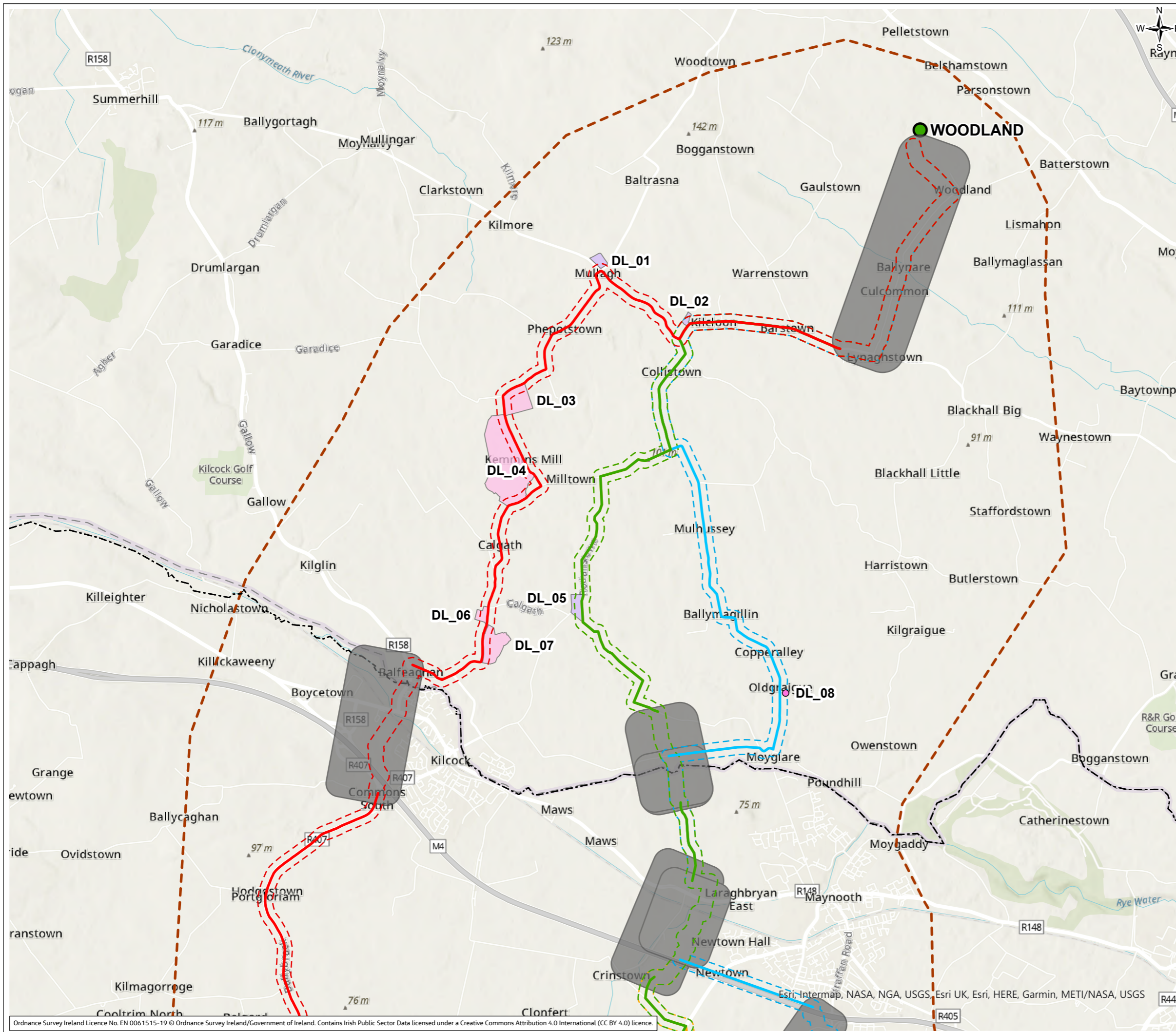
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**FIGURE B.1.3**



**Legend**

- Study Area
- County Boundary
- 400kV Substation
- Proposed Cable Route - Option A (Red)
- Proposed Cable Route - Option B (Green)
- Proposed Cable Route - Option C (Orange)
- Proposed Cable Route - Option D (Blue)
- Off-Road Options Being Explored
- Cable Route Option A 100m Buffer
- Cable Route Option B 100m Buffer
- Cable Route Option C 100m Buffer
- Cable Route Option D 100m Buffer
- Gardens and Designed Landscapes (GDL) Point (NIAH)
- Gardens and Designed Landscapes (GDL) Polygon (NIAH)
- Gardens and Designed Landscapes (GDL) Polygon (Historic Mapping)



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Project

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Drawing Title

Gardens and Designed Landscapes (GDLs) on the Survey of Historic Gardens and Designed Landscapes and Demesne Lands Identified from 6 inch to 1 mile First Edition Ordnance Survey Mapping (1837 – 1842)

Drawing Status

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Scale @ A3

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Jacobs No.

321084AH

Client No.

Drawing No.

321084AH-MAP-S4A-B.1.3

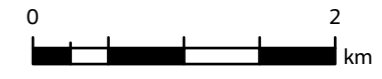
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**FIGURE B.1.3**

**Legend**

- Study Area
- County Boundary
- 400kV Substation
- Proposed Cable Route - Option A (Red)
- Proposed Cable Route - Option B (Green)
- Proposed Cable Route - Option C (Orange)
- Proposed Cable Route - Option D (Blue)
- Off-Road Options Being Explored
- Cable Route Option A 100m Buffer
- Cable Route Option B 100m Buffer
- Cable Route Option C 100m Buffer
- Cable Route Option D 100m Buffer
- Gardens and Designed Landscapes (GDL) Point (NIAH)
- Gardens and Designed Landscapes (GDL) Polygon (NIAH)
- Gardens and Designed Landscapes (GDL) Polygon (Historic Mapping)



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Gardens and Designed Landscapes (GDLs) on the Survey of Historic Gardens and Designed Landscapes and Demesne Lands Identified from 6 inch to 1 mile First Edition Ordnance Survey Mapping (1837 – 1842)

Drawing Status  
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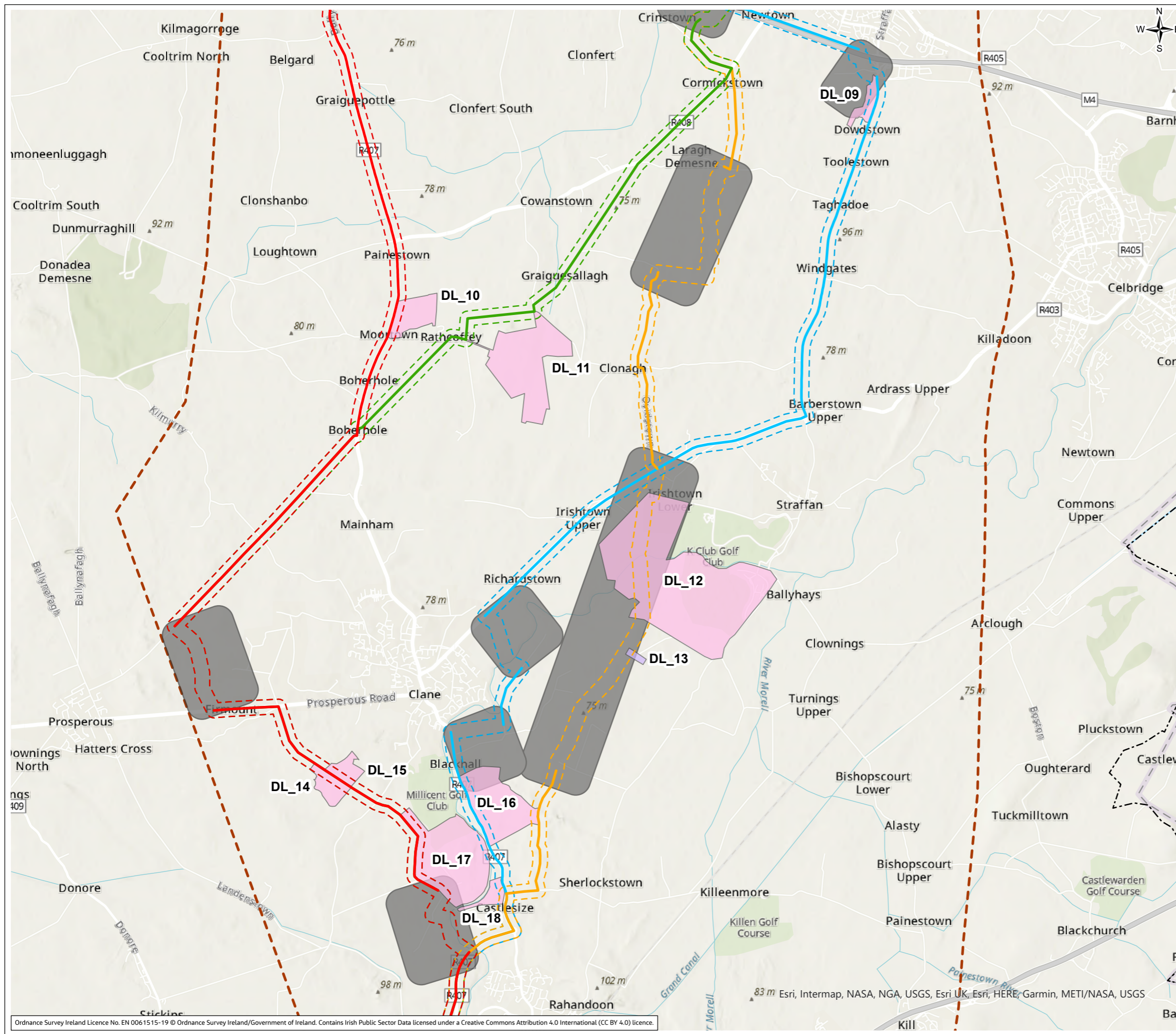
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













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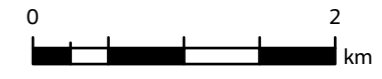




**FIGURE B.1.3**

**Legend**

-  Study Area
-  County Boundary
-  400kV Substation
-  Proposed Cable Route - Option A (Red)
-  Proposed Cable Route - Option B (Green)
-  Proposed Cable Route - Option C (Orange)
-  Proposed Cable Route - Option D (Blue)
-  Off-Road Options Being Explored
-  Cable Route Option A 100m Buffer
-  Cable Route Option B 100m Buffer
-  Cable Route Option C 100m Buffer
-  Cable Route Option D 100m Buffer
-  Gardens and Designed Landscapes (GDL) Point (NIAH)
-  Gardens and Designed Landscapes (GDL) Polygon (NIAH)
-  Gardens and Designed Landscapes (GDL) Polygon (Historic Mapping)



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Drawing Title

Gardens and Designed Landscapes (GDLs) on the Survey of Historic Gardens and Designed Landscapes and Demesne Lands Identified from 6 inch to 1 mile First Edition Ordnance Survey Mapping (1837 – 1842)

Drawing Status

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Scale @ A3

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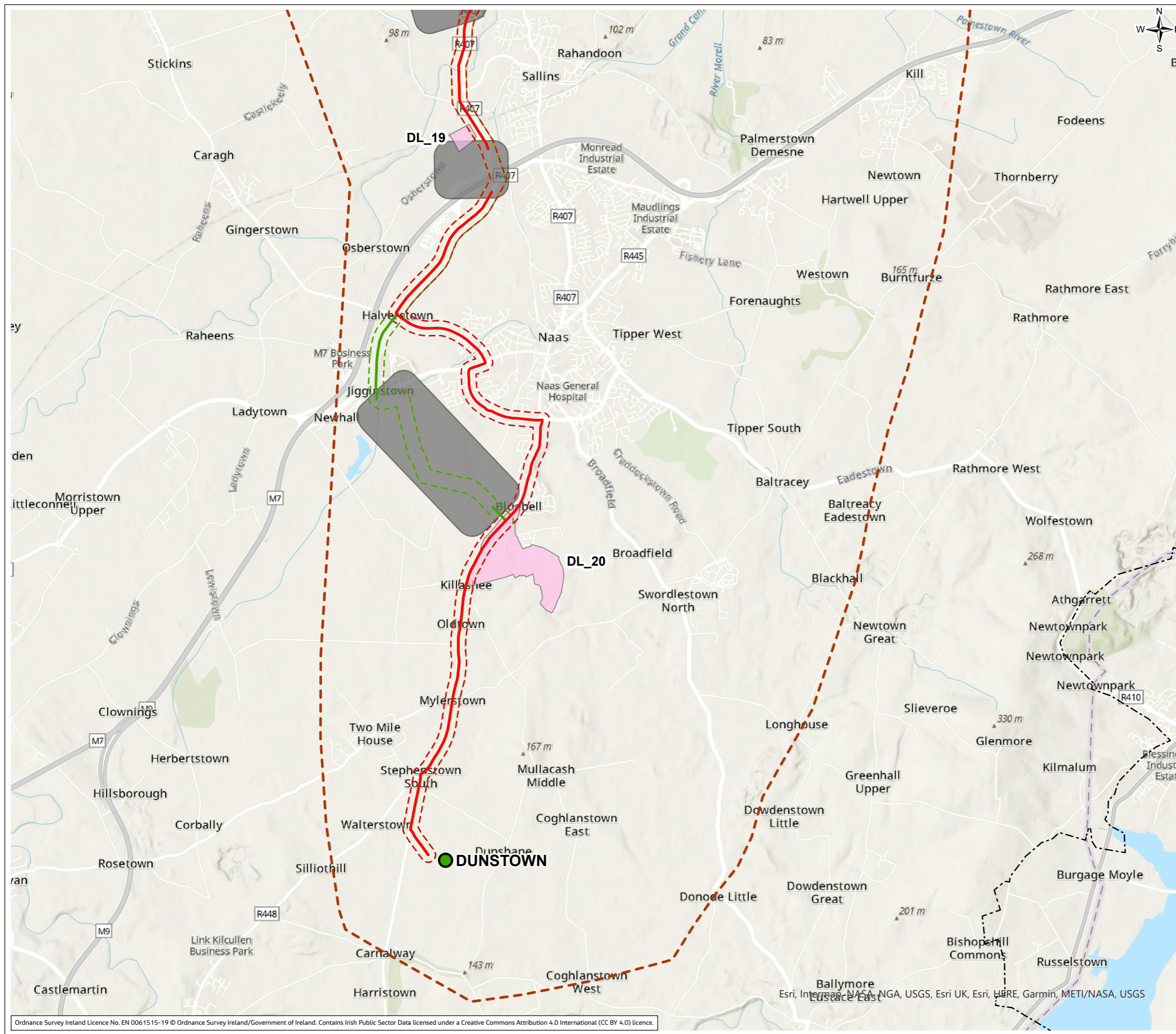
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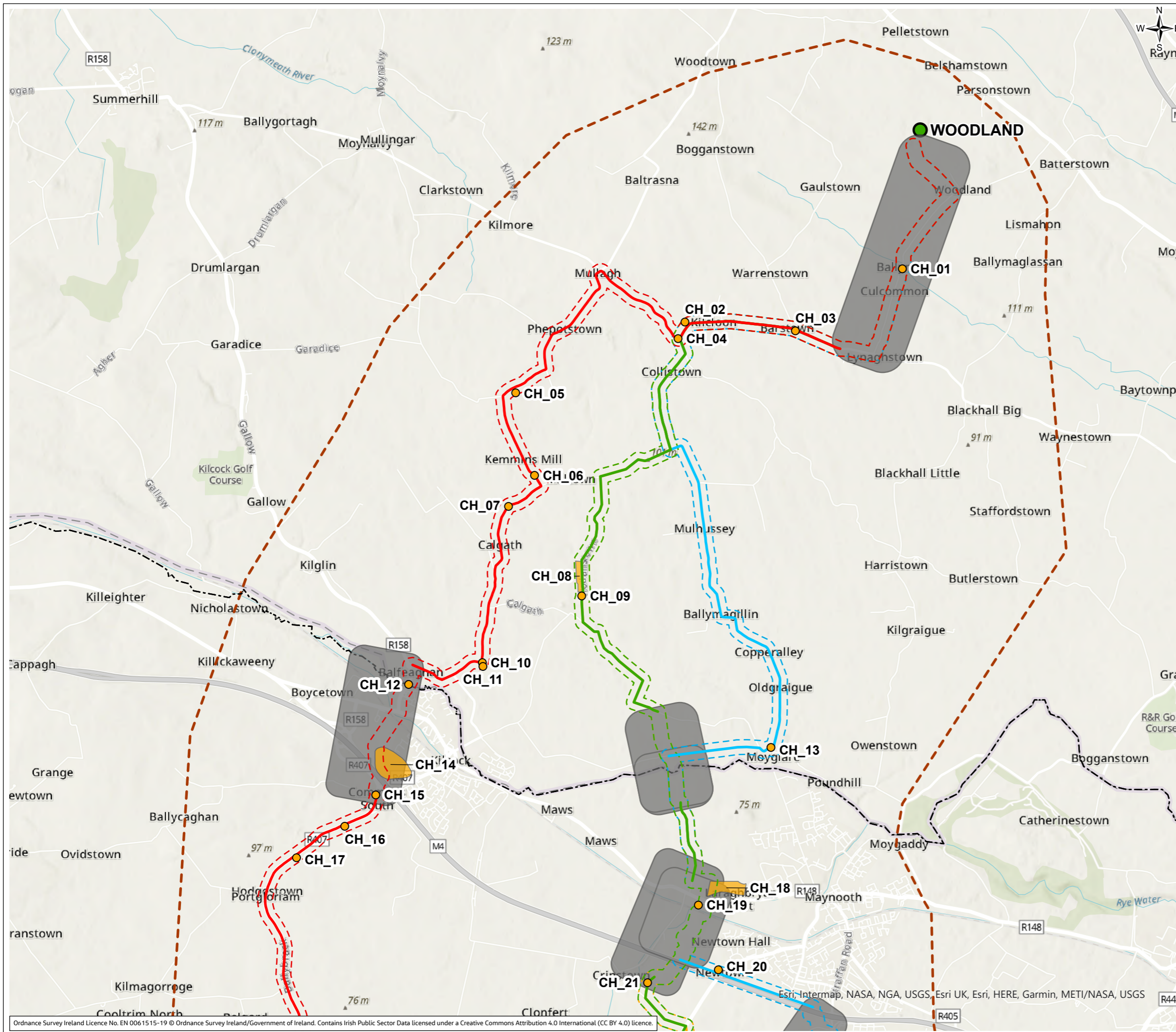
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**FIGURE B.1.4**



**Legend**

- Study Area
- County Boundary
- 400kV Substation
- Proposed Cable Route - Option A (Red)
- Proposed Cable Route - Option B (Green)
- Proposed Cable Route - Option C (Orange)
- Proposed Cable Route - Option D (Blue)
- Off-Road Options Being Explored
- Cable Route Option A 100m Buffer
- Cable Route Option B 100m Buffer
- Cable Route Option C 100m Buffer
- Cable Route Option D 100m Buffer
- Cultural Heritage Point
- Cultural Heritage Polygon



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Drawing Title

Locations of Cultural Heritage Sites  
Within 100m of Option A (Red), Option B (Green),  
Option C (Orange) and Option D (Blue)

Drawing Status

DRAFT

Scale @ A3

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Drawing No.

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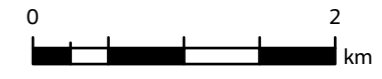
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**FIGURE B.1.4**

**Legend**

- Study Area
- County Boundary
- 400kV Substation
- Proposed Cable Route - Option A (Red)
- Proposed Cable Route - Option B (Green)
- Proposed Cable Route - Option C (Orange)
- Proposed Cable Route - Option D (Blue)
- Off-Road Options Being Explored
- Cable Route Option A 100m Buffer
- Cable Route Option B 100m Buffer
- Cable Route Option C 100m Buffer
- Cable Route Option D 100m Buffer
- Cultural Heritage Point
- Cultural Heritage Polygon



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Drawing Title  
Locations of Cultural Heritage Sites Within 100m of Option A (Red), Option B (Green), Option C (Orange) and Option D (Blue)

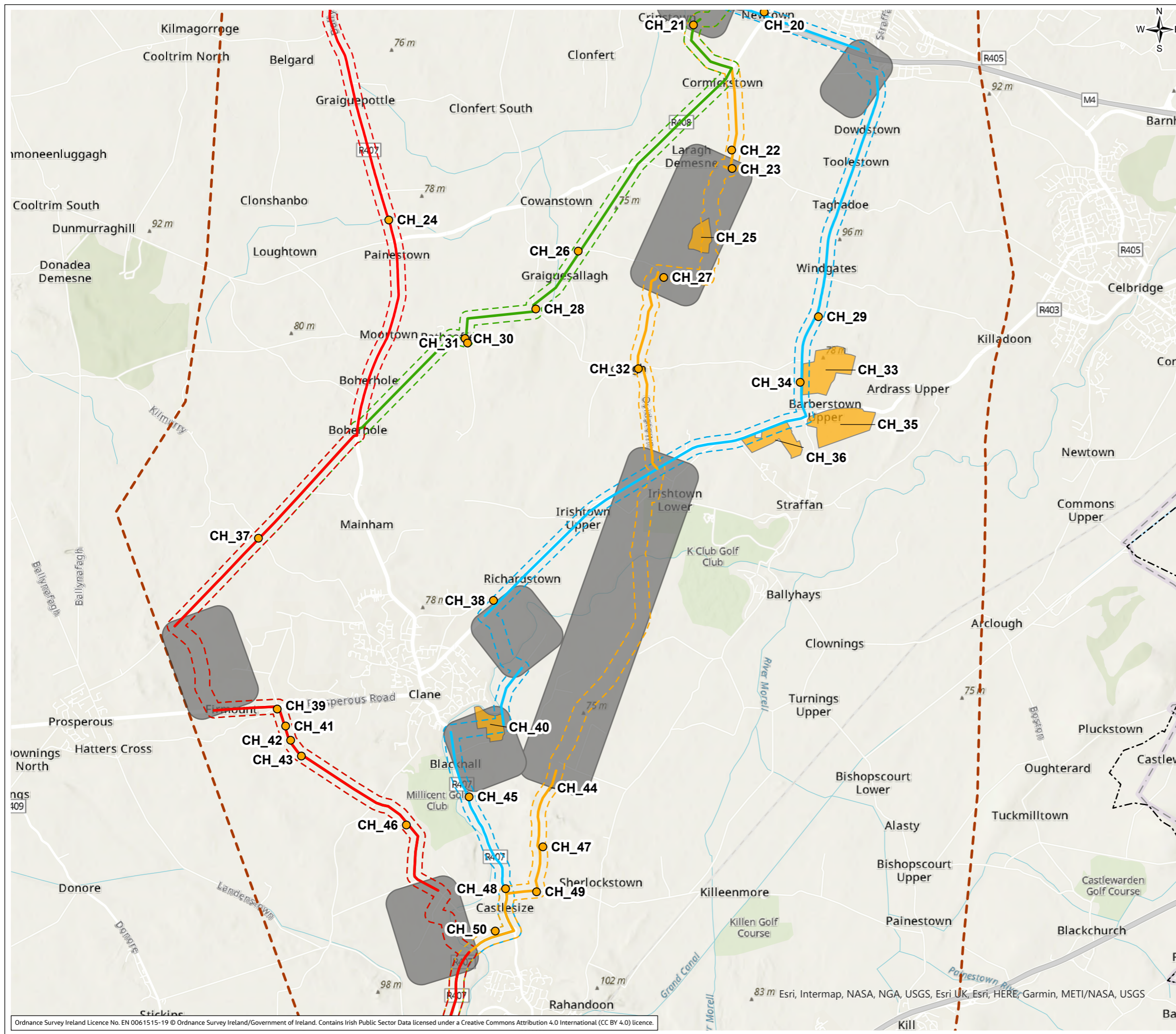
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**FIGURE B.1.4**

**Legend**

-  Study Area
-  County Boundary
-  400kV Substation
-  Proposed Cable Route - Option A (Red)
-  Proposed Cable Route - Option B (Green)
-  Proposed Cable Route - Option C (Orange)
-  Proposed Cable Route - Option D (Blue)
-  Off-Road Options Being Explored
-  Cable Route Option A 100m Buffer
-  Cable Route Option B 100m Buffer
-  Cable Route Option C 100m Buffer
-  Cable Route Option D 100m Buffer
-  Cultural Heritage Point
-  Cultural Heritage Polygon



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Drawing Title

Locations of Cultural Heritage Sites  
Within 100m of Option A (Red), Option B (Green),  
Option C (Orange) and Option D (Blue)

Drawing Status

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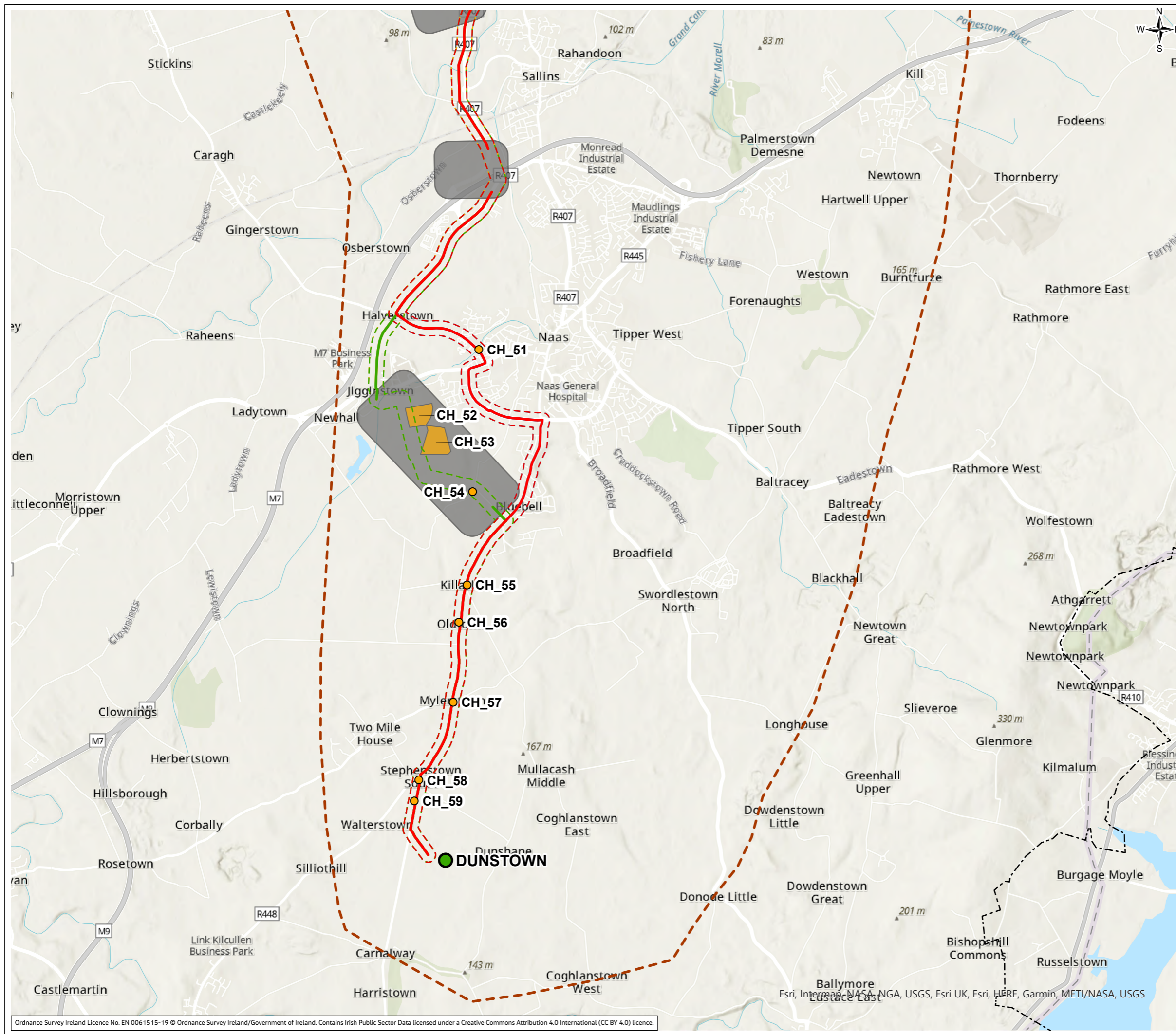
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Drawing No.

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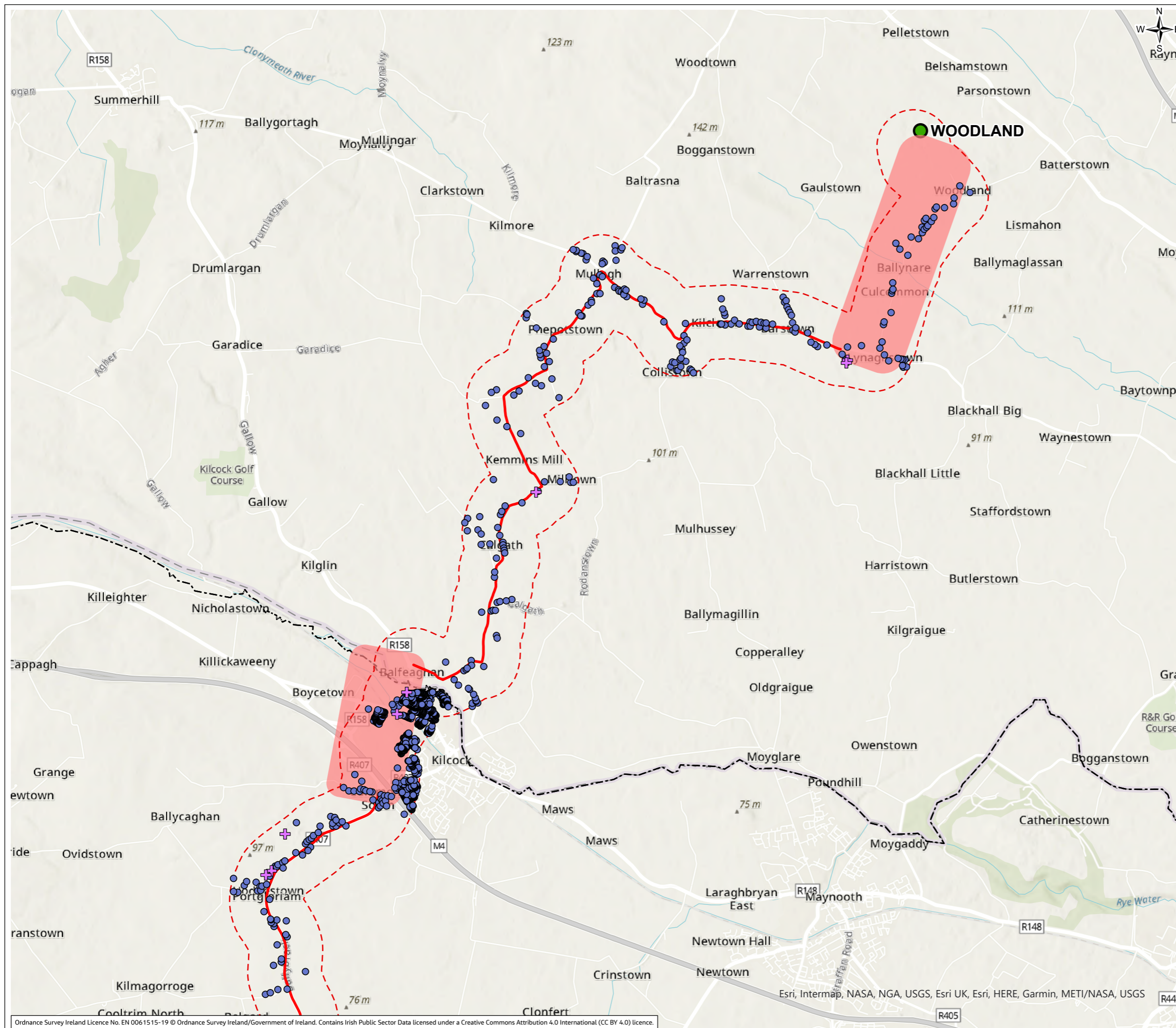
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## **Appendix C. 1 – Socio-Economic Figures**



**FIGURE C.1.1**



- Legend**
- County Boundary
  - 400kV Substation
  - Proposed Cable Route - Option A (Red)
  - Off Road Options Being Explored - Option A
  - Cable Route Option A 500m Buffer
  - + Commercial/Retail Property
  - Residential Property



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**EIRGRID**

Project

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Drawing Title

Social Impact Assessment - Residential and Commercial Receptors  
 Proposed Cable Route Option A (Red)  
 Sheet 1 of 3

Drawing Status

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Jacobs No.

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Client No.

Drawing No.








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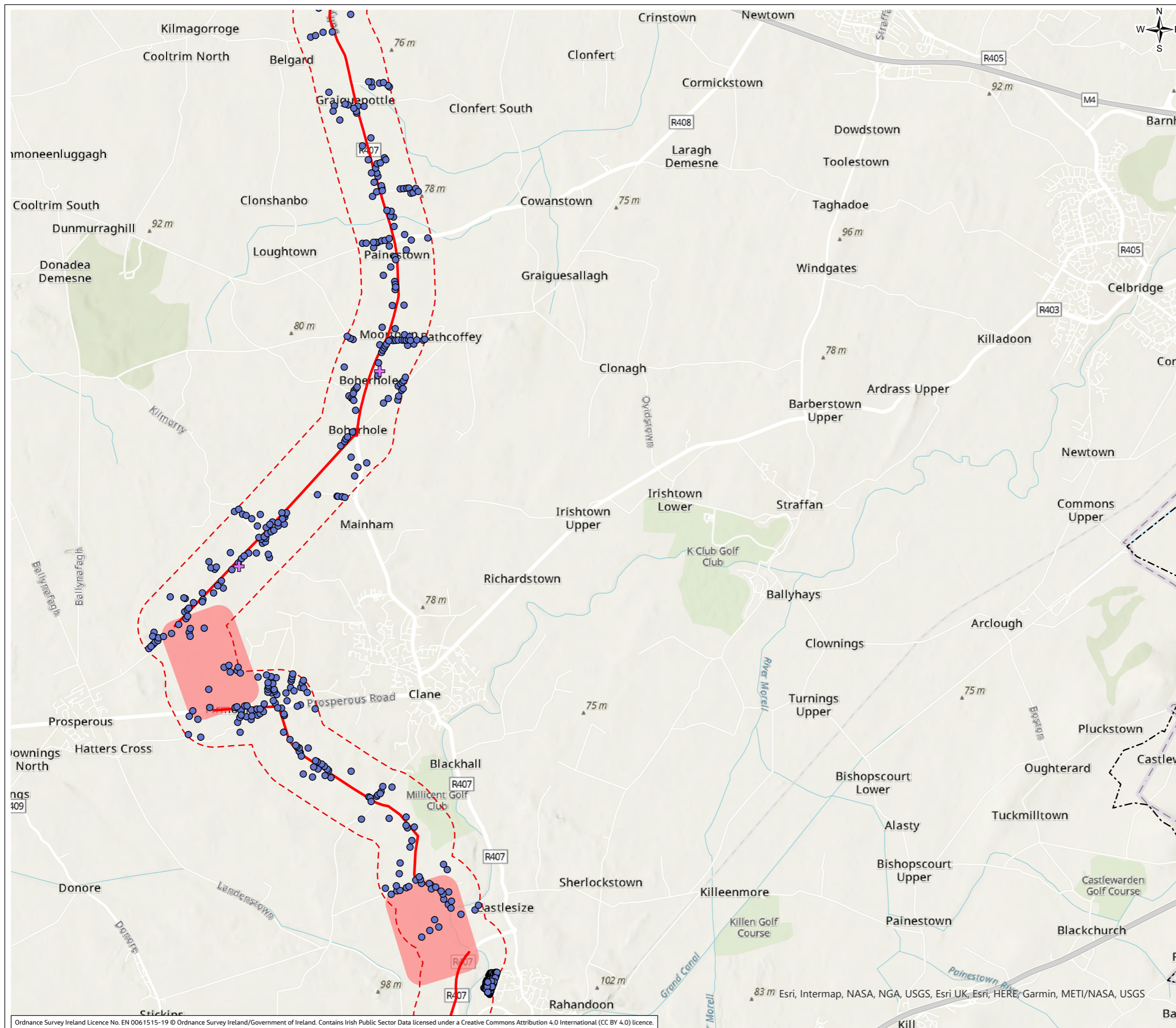
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**FIGURE C.1.1**

**Legend**

-  County Boundary
-  400kV Substation
-  Proposed Cable Route - Option A (Red)
-  Off Road Options Being Explored - Option A
-  Cable Route Option A 500m Buffer
-  Commercial/Retail Property
-  Residential Property



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Project

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Drawing Title

Social Impact Assessment - Residential and Commercial Receptors  
Proposed Cable Route Option A (Red)  
Sheet 2 of 3

Drawing Status

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Scale @ A3

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Jacobs No.

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Client No.

Drawing No.








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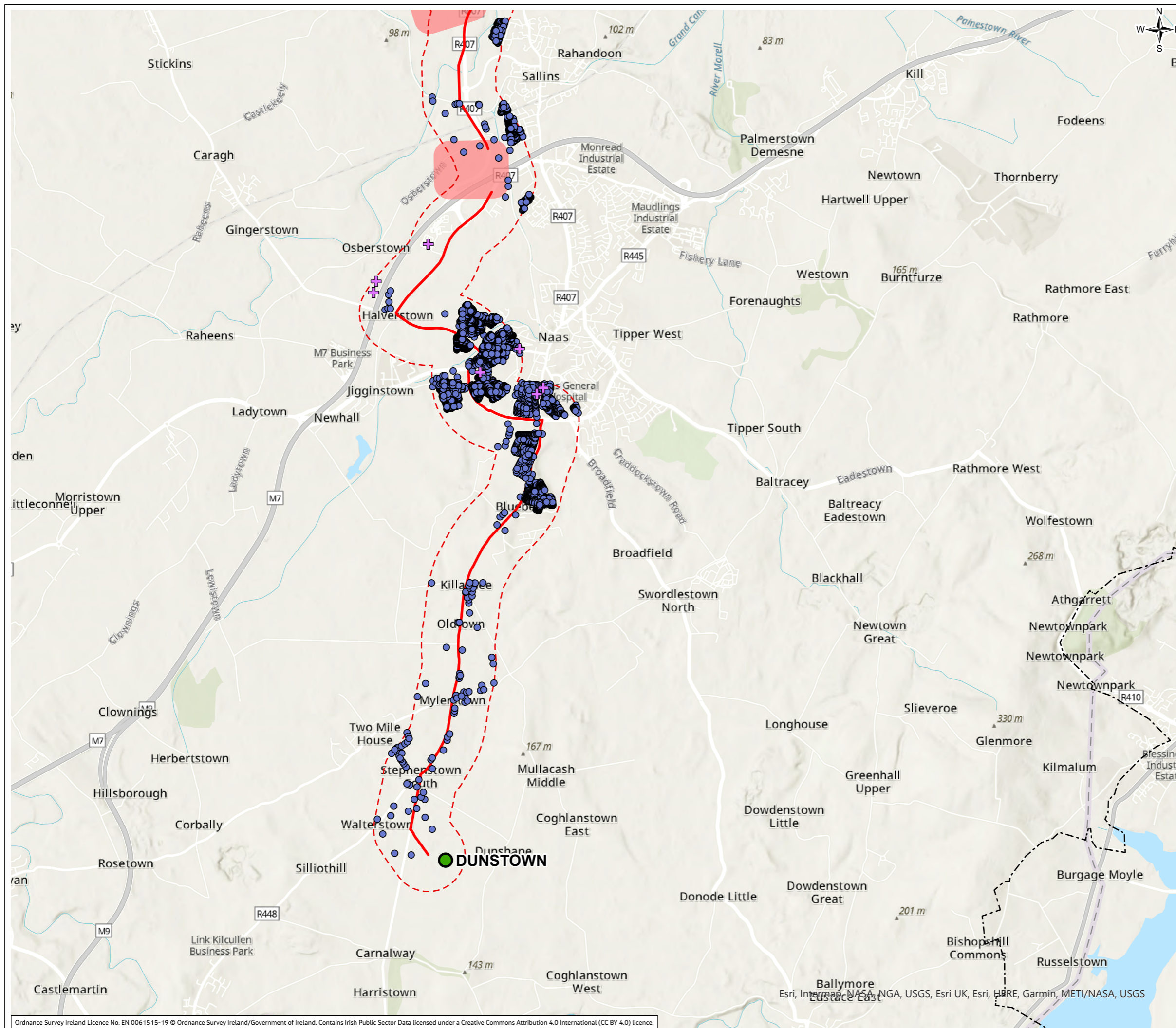
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**FIGURE C.1.1**

**Legend**

-  County Boundary
-  400kV Substation
-  Proposed Cable Route - Option A (Red)
-  Off Road Options Being Explored - Option A
-  Cable Route Option A 500m Buffer
-  Commercial/Retail Property
-  Residential Property



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EirGrid Kildare-Meath Grid Upgrade

Drawing Title

Social Impact Assessment - Residential and Commercial Receptors  
 Proposed Cable Route Option A (Red)  
 Sheet 3 of 3

Drawing Status

DRAFT

Scale @ A3

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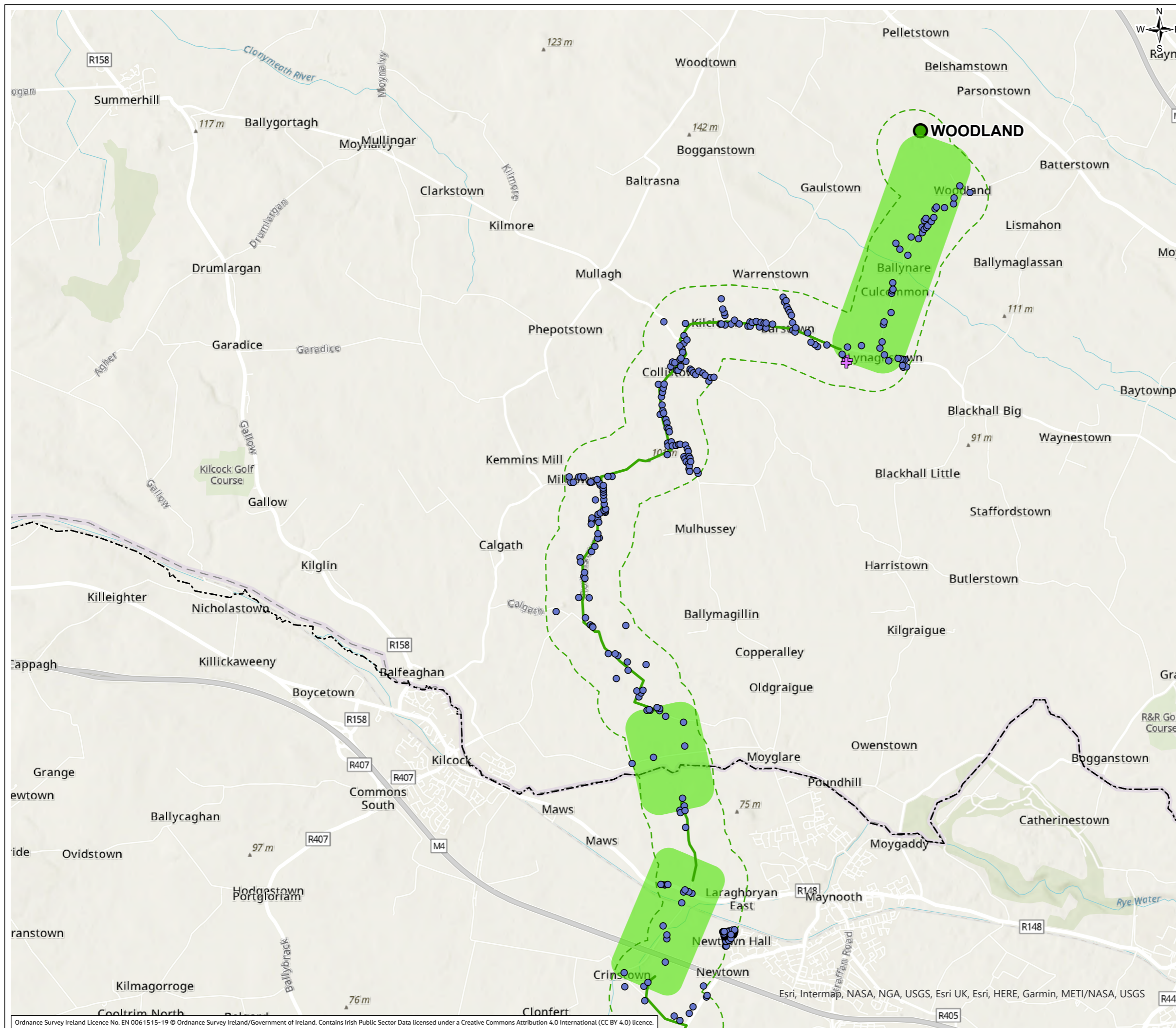
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**FIGURE C.1.2**

**Legend**

- County Boundary
- 400kV Substation
- Proposed Cable Route - Option B (Green)
- Off Road Options Being Explored - Option B
- Cable Route Option B 500m Buffer
- + Commercial/Retail Property
- Residential Property



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Drawing Title

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Proposed Cable Route Option B (Green)  
Sheet 1 of 3

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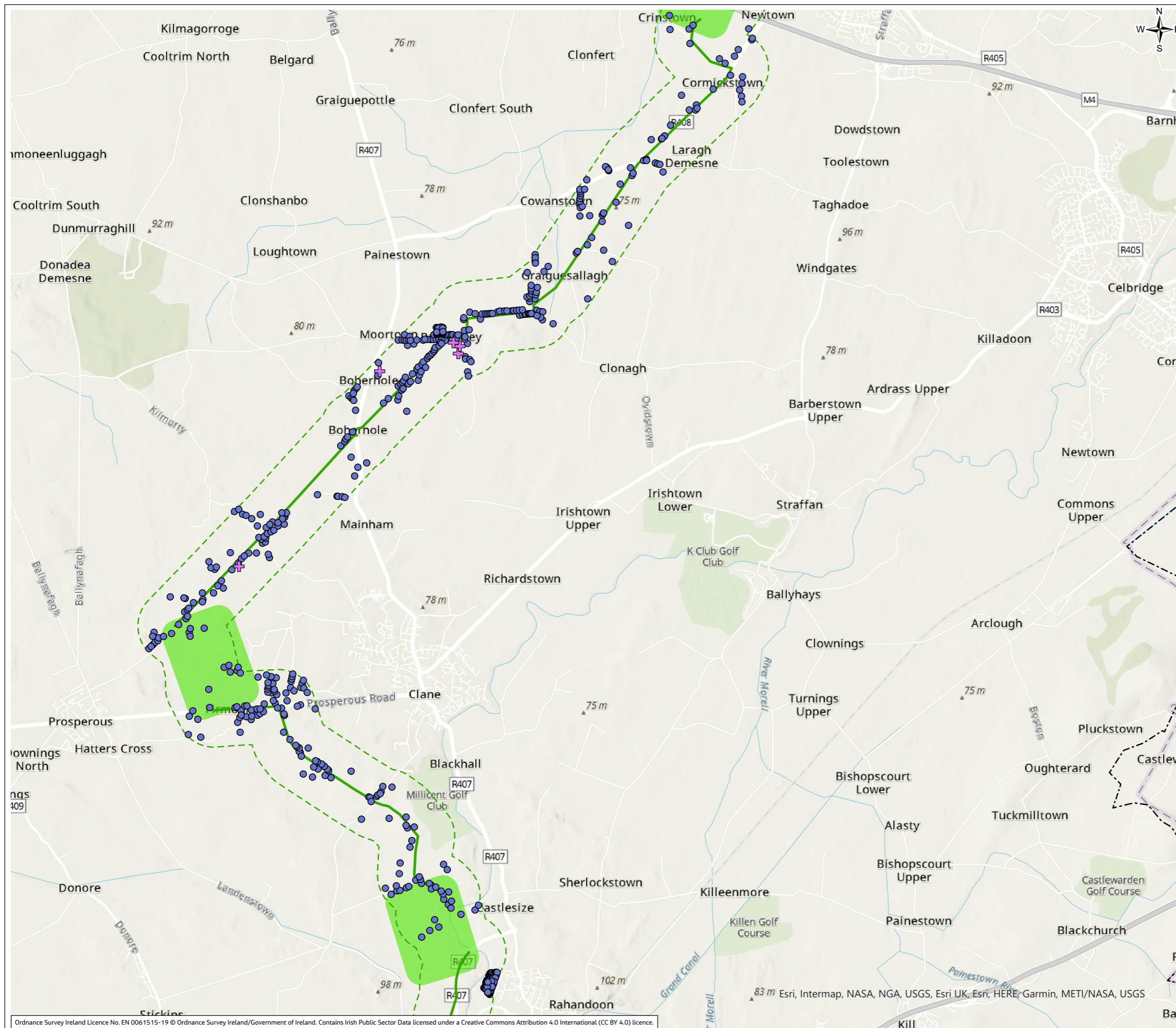
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**FIGURE C.1.2**

**Legend**

- County Boundary
- 400kV Substation
- Proposed Cable Route - Option B (Green)
- Off Road Options Being Explored - Option B
- Cable Route Option B 500m Buffer
- + Commercial/Retail Property
- Residential Property



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Proposed Cable Route Option B (Green)  
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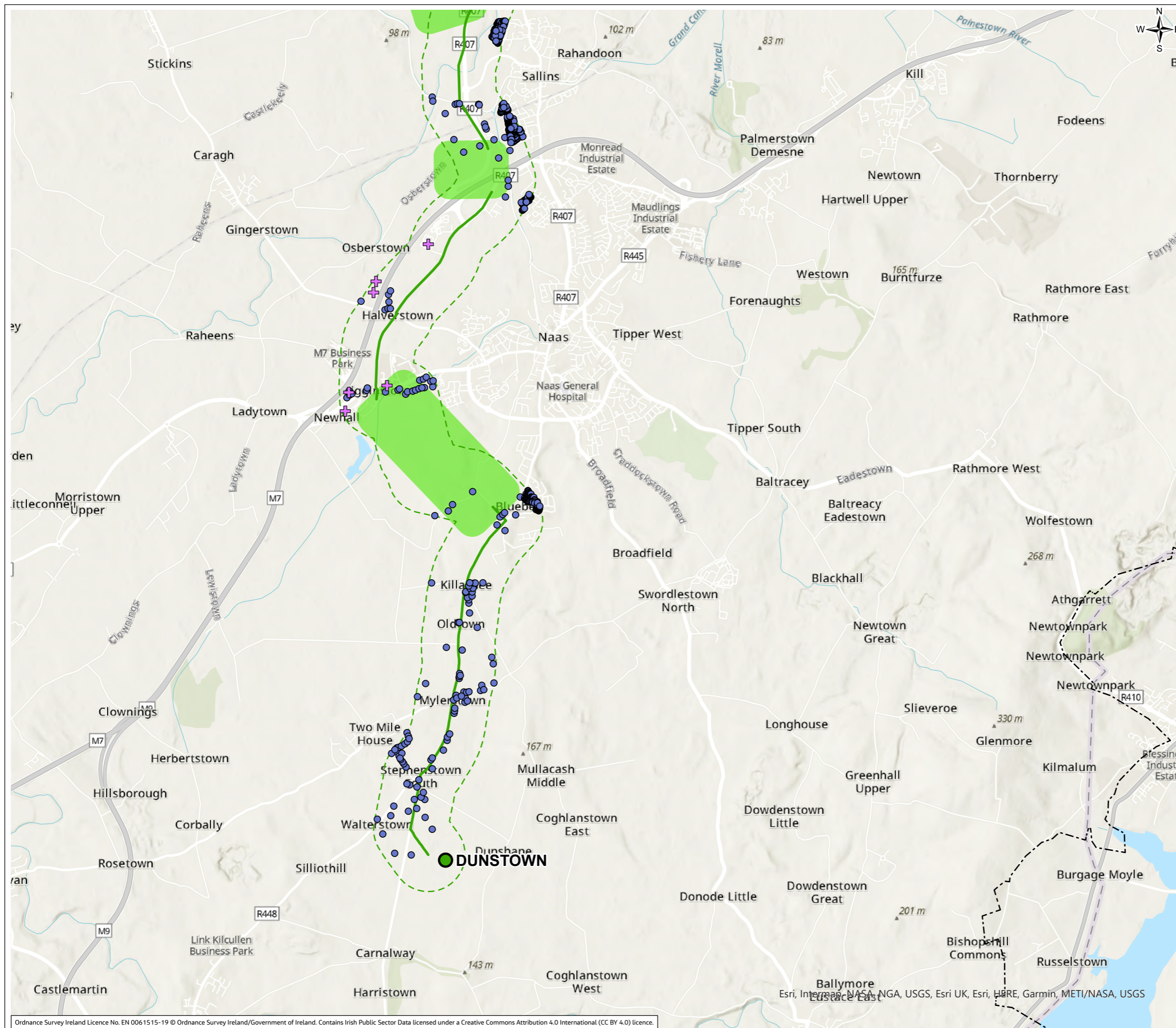
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**FIGURE C.1.2**

**Legend**

-  County Boundary
-  400kV Substation
-  Proposed Cable Route - Option B (Green)
-  Off Road Options Being Explored - Option B
-  Cable Route Option B 500m Buffer
-  Commercial/Retail Property
-  Residential Property



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Proposed Cable Route Option B (Green)  
Sheet 3 of 3

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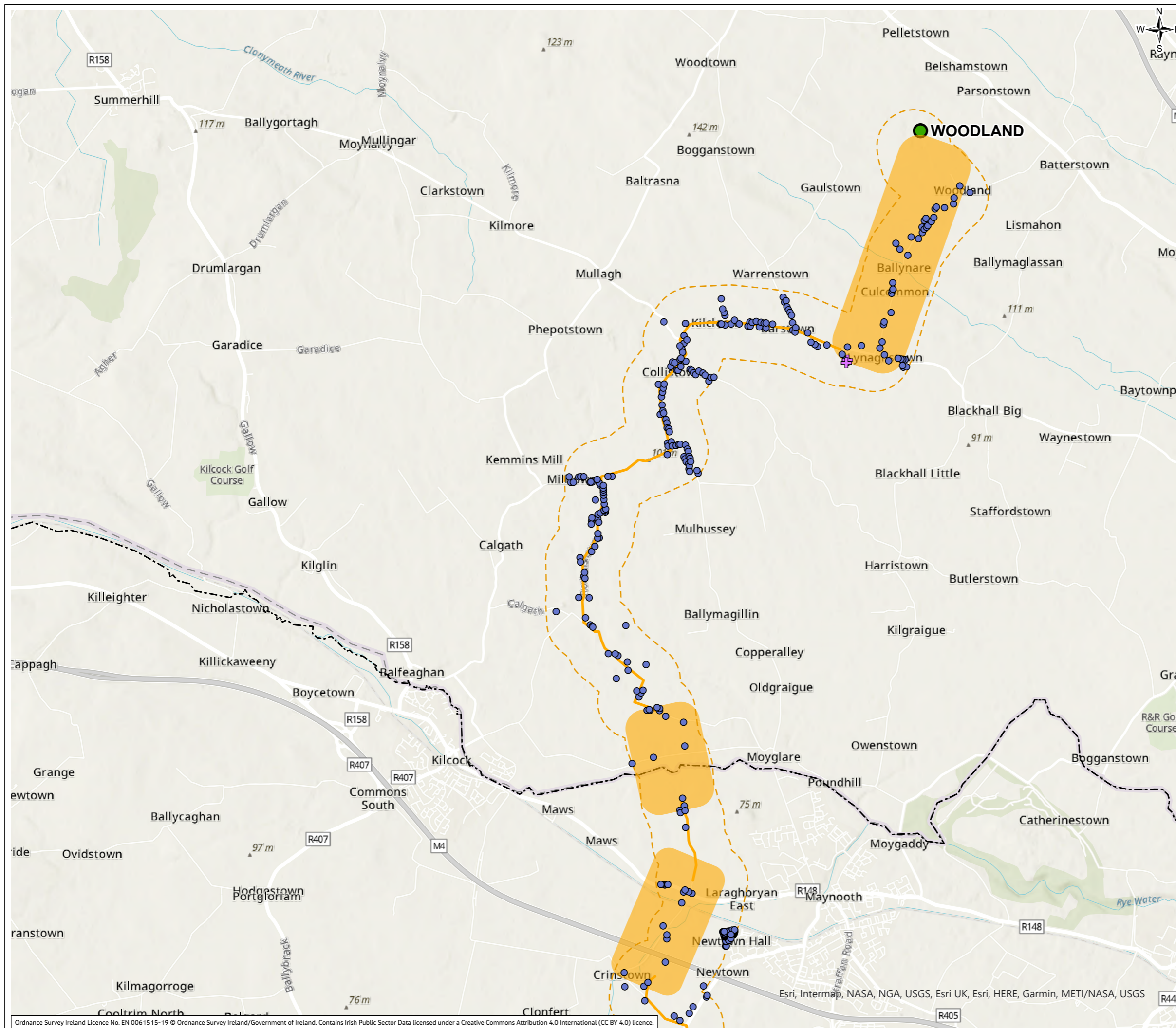
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**FIGURE C.1.3**

**Legend**

- County Boundary
- 400kV Substation
- Proposed Cable Route - Option C (Orange)
- Off Road Options Being Explored - Option C
- Cable Route Option C 500m Buffer
- + Commercial/Retail Property
- Residential Property



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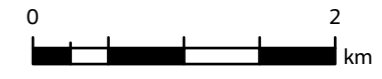
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**FIGURE C.1.3**

**Legend**

-  County Boundary
-  400kV Substation
-  Proposed Cable Route - Option C (Orange)
-  Off Road Options Being Explored - Option C
-  Cable Route Option C 500m Buffer
-  Commercial/Retail Property
-  Residential Property



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Proposed Cable Route Option C (Orange)  
Sheet 2 of 3**

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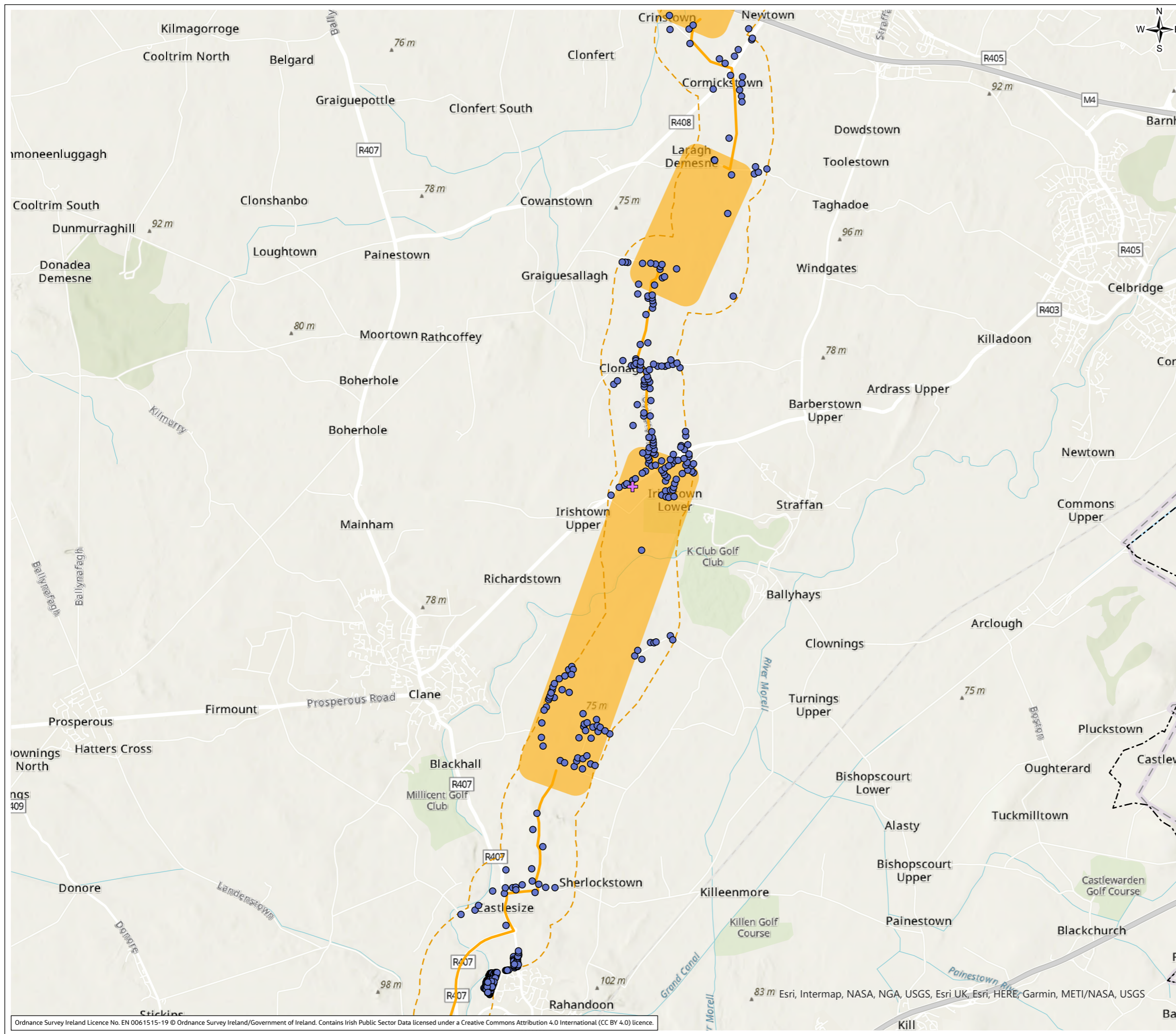
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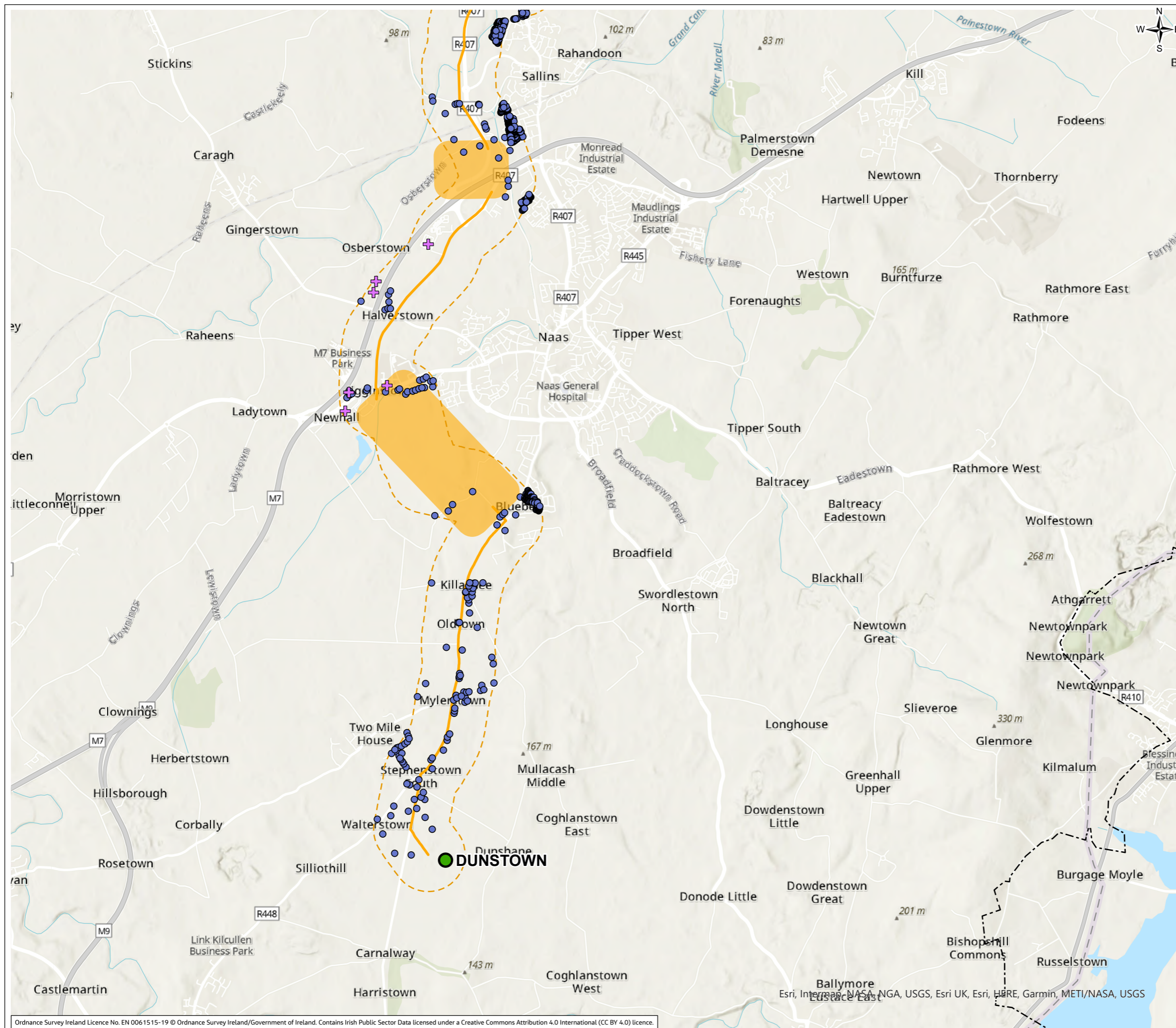
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**FIGURE C.1.3**

**Legend**

-  County Boundary
-  400kV Substation
-  Proposed Cable Route - Option C (Orange)
-  Off Road Options Being Explored - Option C
-  Cable Route Option C 500m Buffer
-  Commercial/Retail Property
-  Residential Property



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Proposed Cable Route Option C (Orange)  
Sheet 3 of 3

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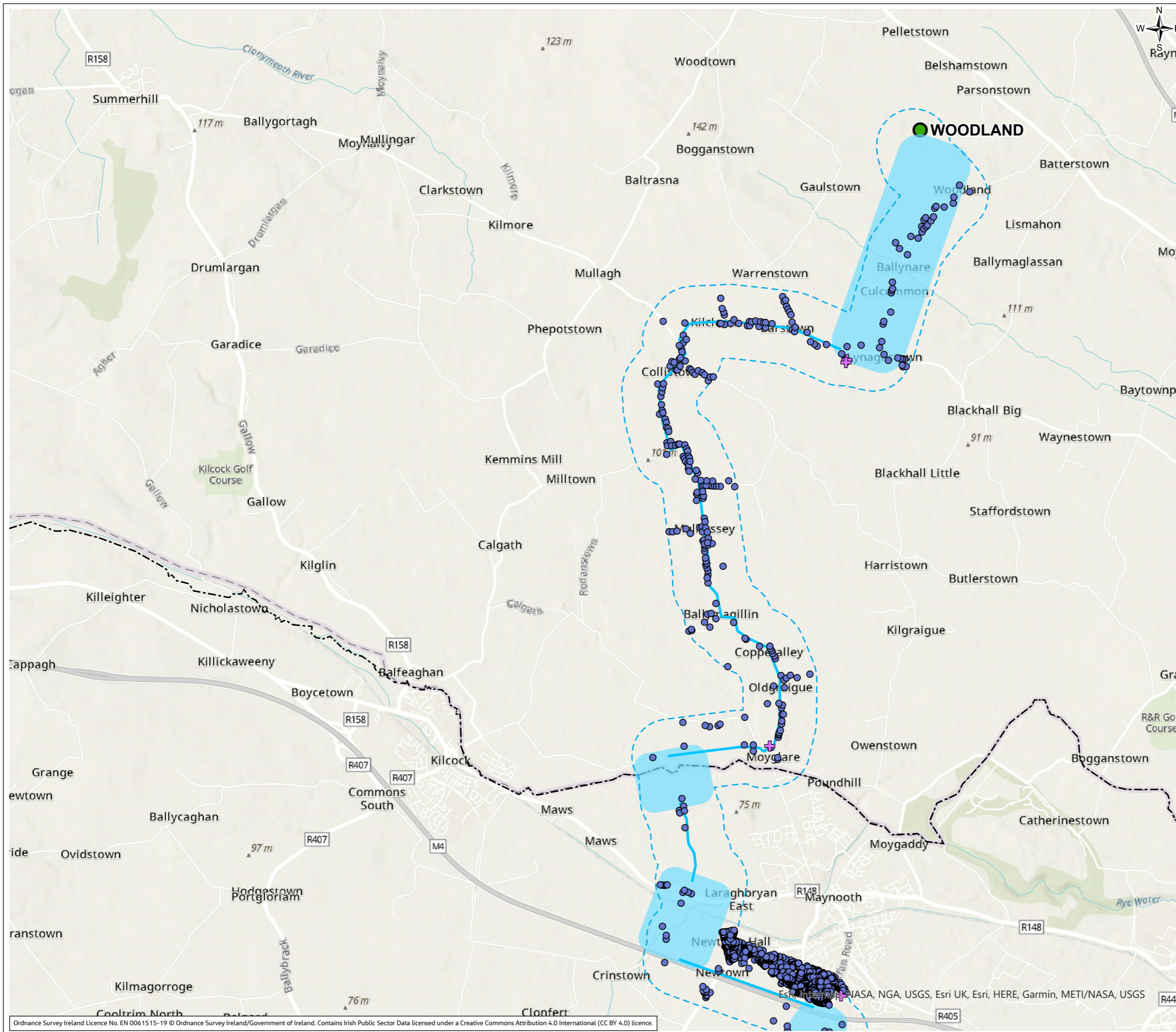
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**FIGURE C.1.4**



**Legend**

- County Boundary
- 400kV Substation
- Proposed Cable Route - Option D (Blue)
- Off Road Options Being Explored - Option D
- Cable Route Option D 500m Buffer
- Commercial/Retail Property
- Residential Property



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Proposed Cable Route Option D (Blue)  
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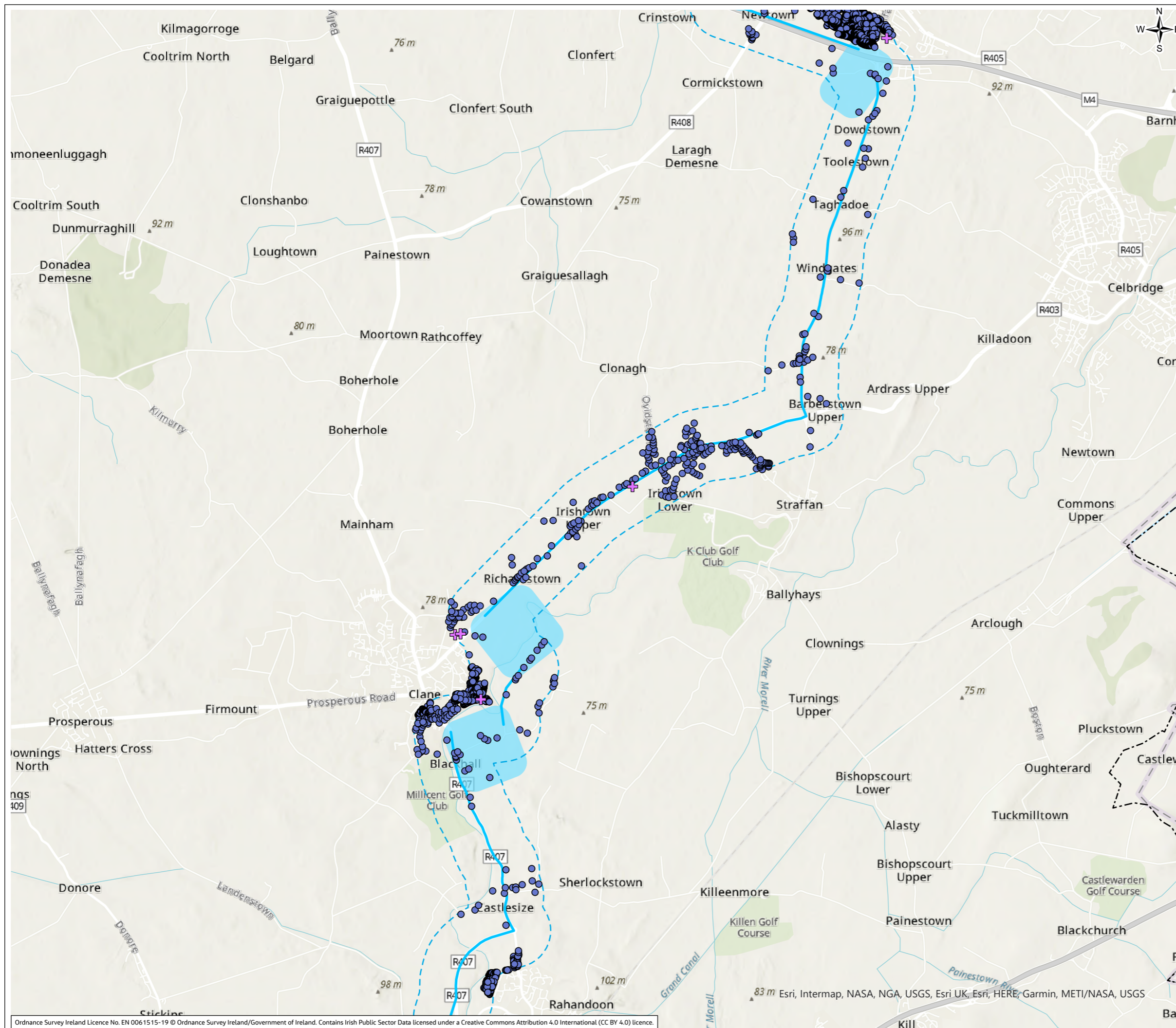
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**FIGURE C.1.4**

**Legend**

- County Boundary
- 400kV Substation
- Proposed Cable Route - Option D (Blue)
- Off Road Options Being Explored - Option D
- Cable Route Option D 500m Buffer
- + Commercial/Retail Property
- Residential Property



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Sheet 2 of 3

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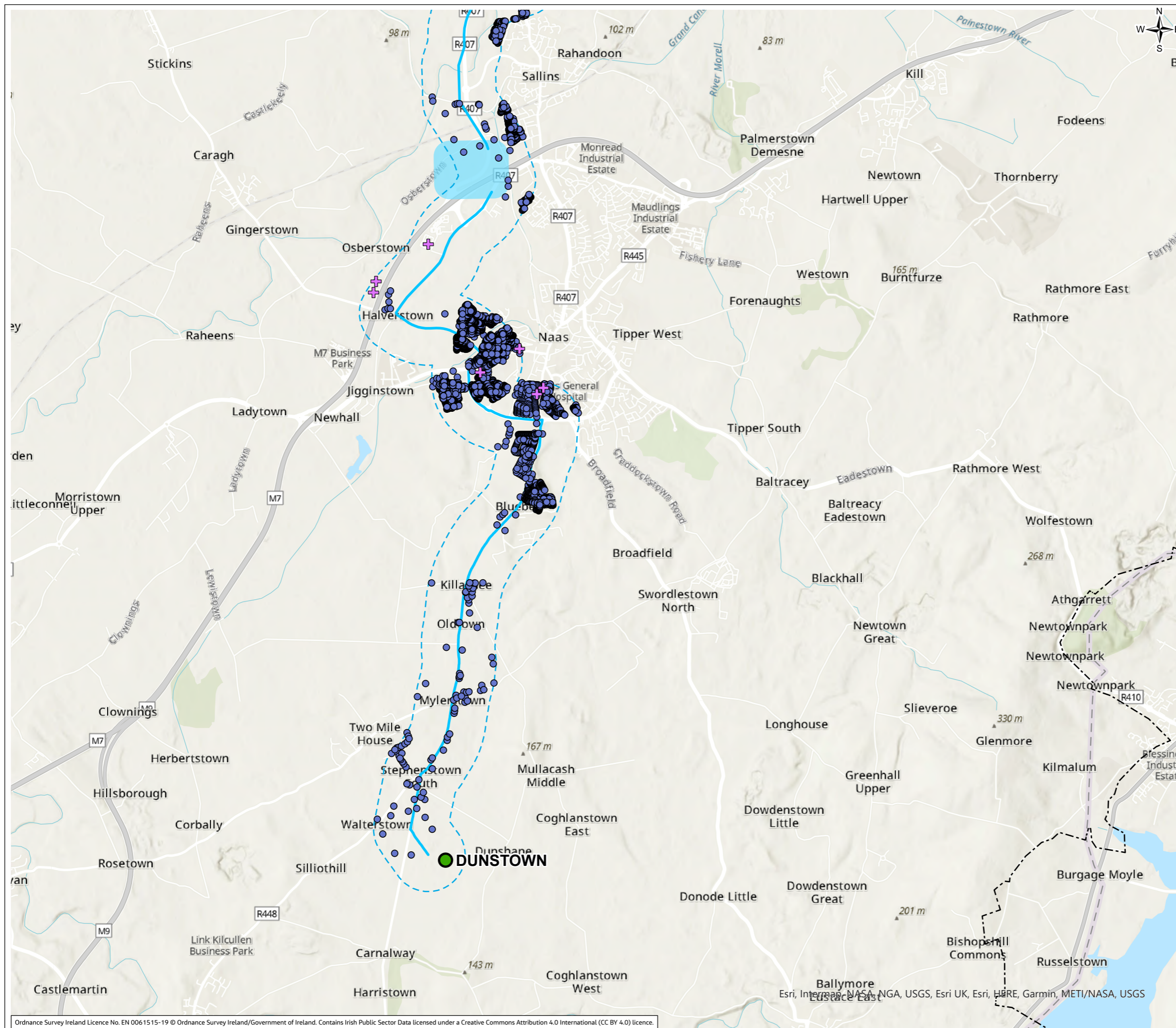
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**FIGURE C.1.4**

**Legend**

-  County Boundary
-  400kV Substation
-  Proposed Cable Route - Option D (Blue)
-  Off Road Options Being Explored - Option D
-  Cable Route Option D 500m Buffer
-  Commercial/Retail Property
-  Residential Property



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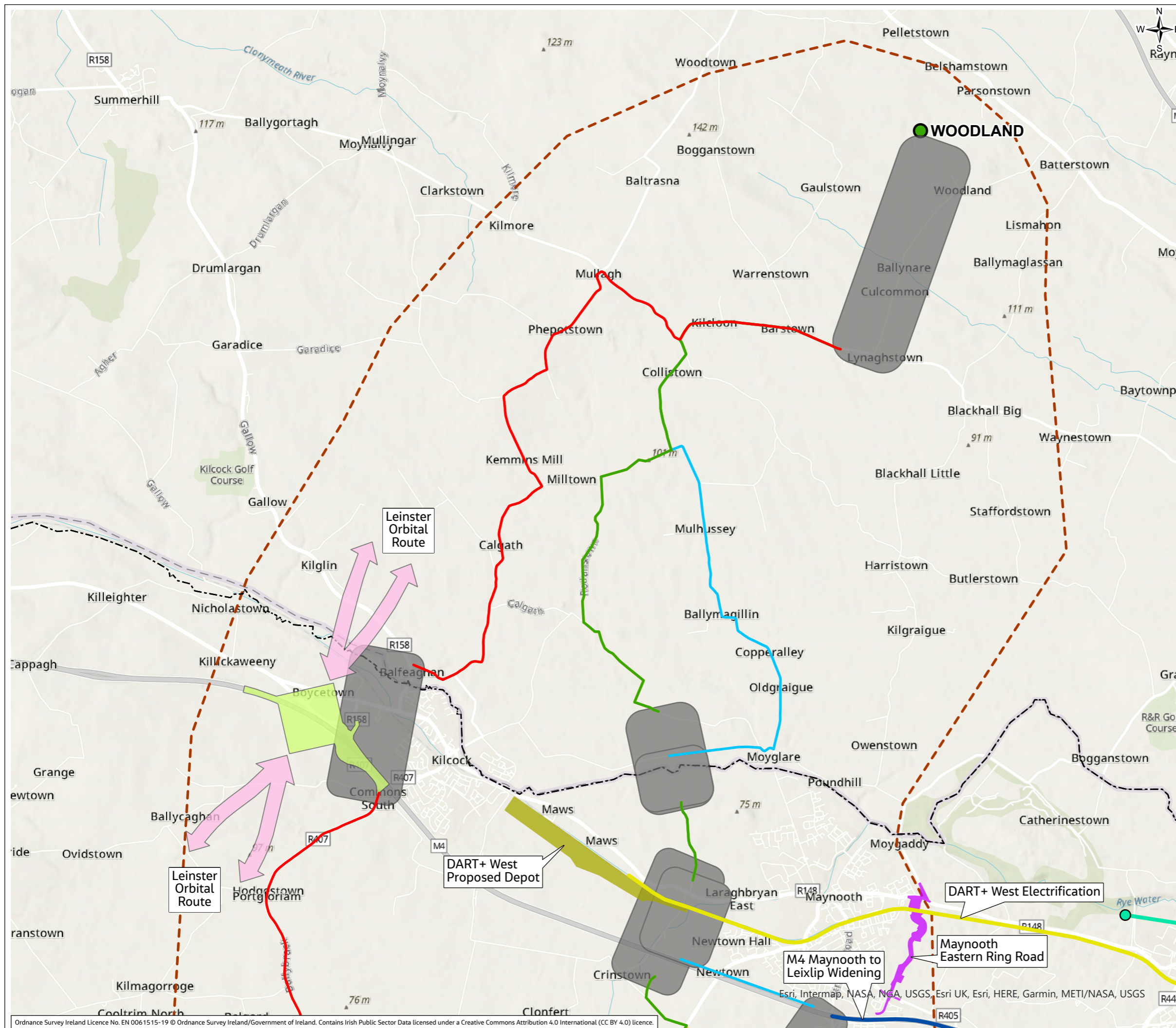
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## **Appendix D. 1 – Key Infrastructure**



FIGURE D.1.1



**Legend**

- Study Area
  - County Boundary
  - 400kV Substation
  - Proposed Cable Route - Option A (Red)
  - Proposed Cable Route - Option B (Green)
  - Proposed Cable Route - Option C (Orange)
  - Proposed Cable Route - Option D (Blue)
  - Off-Road Options Being Explored
- Key Infrastructure**
- Gas Network AGI (Above-Ground Installation)
  - Gas Networks Ireland - Network Implementation Plan
  - M4 Maynooth to Leixlip Widening
  - DART+ West Electrification
  - DART+ West Proposed Depot
  - Leinster Orbital Route - Junction Protection Zone
  - Leinster Orbital Route - Indicative Route Corridor
  - Maynooth Eastern Ring Road



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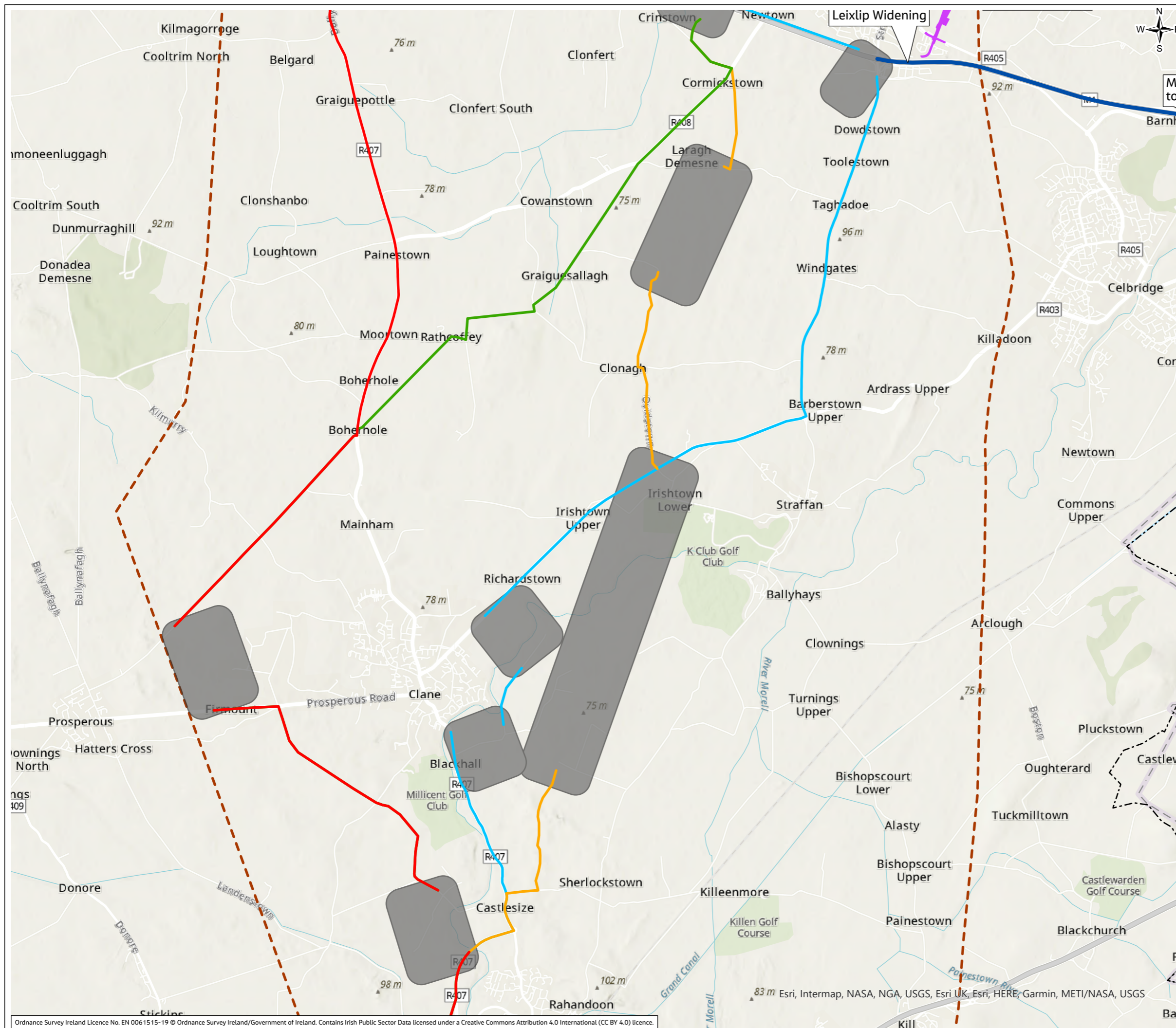
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**FIGURE D.1.1**



- Legend**
- Study Area
  - County Boundary
  - Proposed Cable Route - Option A (Red)
  - Proposed Cable Route - Option B (Green)
  - Proposed Cable Route - Option C (Orange)
  - Proposed Cable Route - Option D (Blue)
  - Off-Road Options Being Explored
  - M4 Maynooth to Leixlip Widening
  - Maynooth Eastern Ring Road



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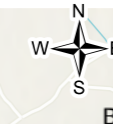
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FIGURE D.1.1

**Legend**

- Study Area
  - County Boundary
  - 400kV Substation
  - Proposed Cable Route - Option A (Red)
  - Proposed Cable Route - Option B (Green)
  - Proposed Cable Route - Option C (Orange)
  - Proposed Cable Route - Option D (Blue)
  - Off-Road Options Being Explored
- Key Infrastructure**
- Gas Network AGI (Above-Ground Installation)
  - Gas Networks Ireland - Network Implementation Plan
  - Naas Inner Relief Road



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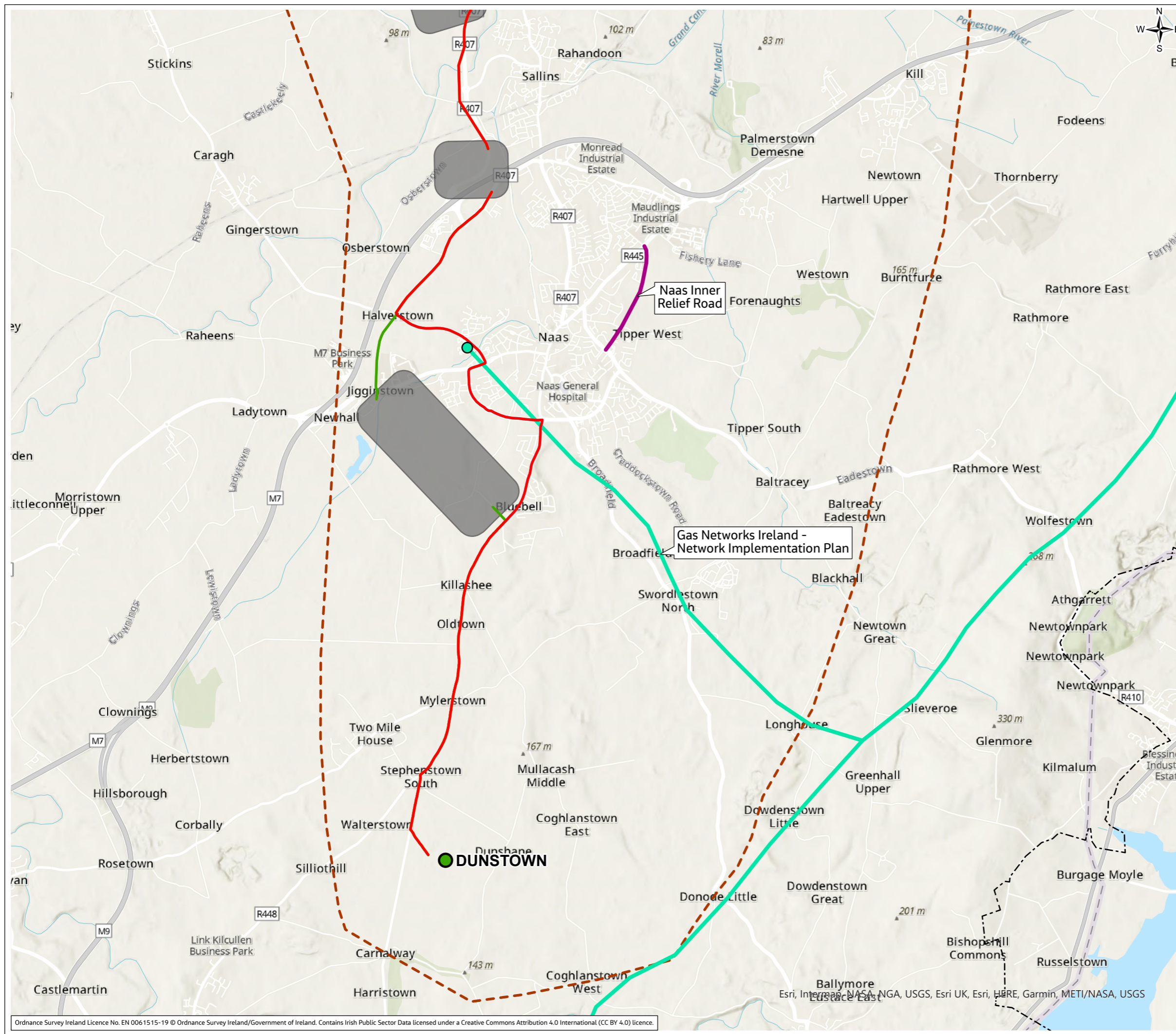
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