codling wind park

Environmental Impact Assessment Report

Volume 4

Appendix 24.4 OTI construction phase modelling


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Abbreviations

Abbreviation	Term in Full
CWP	Codling Wind Park
EIAR	Environmental Impact Assessment Report
ESBN	ESB Networks
HDD	Horizontal directional drilling
OWF	Offshore wind farm
O&M	Operations and maintenance
OSS	Offshore substation structure
OTI	Onshore Transmission Infrastructure
PPV	Peak Particle Velocity
TJB	Transition joint bay

1 OTI CONSTRUCTION PHASE MODELLING

1.1 Introduction

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish sea approximately 13 - 22 km off the east coast of Ireland, at County Wicklow.

2. This appendix forms part of **Chapter 24 Noise and Vibration** of the Environmental Impact Assessment Report (EIAR) for the CWP Project.

3. This appendix presents the following related to the OTI construction and operational phase modelling:

   - Detailed plant lists of indicative construction plant including associated on-times for all construction activities that have been reviewed and assessed to identify the highest noise and vibration values for the OTI construction phases.

OTI construction phase plant assessment to identify the highest noise scenarios

4. **Table 1.1** presents a summary of the calculated highest noise scenarios for the OTI construction cumulative sound power values for each area of works i.e. landfall, intertidal, onshore cable, onshore substation and ESBN network cable.

5. Scenarios 1 to 6 are identified as the highest noise scenarios based on the highest cumulative sound power in each works area.

Table 1.1 Summary OTI construction activities, sound power values and scenarios

Description	Cumulative Sound Power dB (A)	Highest noise scenarios ID
Landfall		
Cable duct installation - open cut	120	Impact 1 scenario 1 including coffer dam piling
Landfall		
TJB construction works within which the offshore export cables are jointed to the onshore export cables	110	
TJB piling works	116	Impact 2 scenarios 2.1, 2.2 and 2.3 at TJB
Construction of a temporary access ramp onto the intertidal area	112	
Intertidal area		
Intertidal cable duct installation including cable laying	115	

Description	Cumulative Sound Power dB (A)	Highest noise scenarios ID
Tensioner platforms, rollers and raised equipment storage platform including piling works	116	Impact 3 scenario 3 Tensioner piling
Onshore export cables - Tunnel		
Underground Shaft - Launch Site - Main / Second/ Reception	113	Impact 4 scenarios 4.1, 4.2 and 4.3
Pipe Jacking required for the underground tunnelling activities.	112	
Onshore Substation		
General construction activities	117	
Onshore substation		
Piling works	119	Impact 5 scenario 5
ESBN network cable works - HDD		
HDD Trenchless crossings (per location)	115	Impact 6 scenario 6

Indicative OTI construction plant per works area

6. The indicative OTI construction plant for each works area is presented in **Table 1.2** below with a summary of the plant percentage operating time, number of plant items, noise data reference, source of sound pressure levels at 10 m distance.

Table 1.2 Summary of indicative construction plant noise levels for each activity

Plant	% on time over 12hr working day	No. of plant	Data Source BS 5228- 1:2009+A1:2014	Activity dB $L_{Aeq,T}$ at 10m
Landfall: cable duct installation (impact 1 scenario 1)				
Diesel Generator	100	1	Table C.4:84	74
Site Lighting	40	4	Table C.4:86	65
Telehandler	70	1	Table C.4:54	79
Back-hoe Excavator	50	1	Table C.2:8	68
Dumper 3t	50	1	Table C.4:9	77
Tractor (towing trailer)	30	1	Table C4.75	79
Materials Tanker	30	1	Table C.4:15	76
Fuel Tanker	10	1	Table C.4:15	76
De-watering Pump	20	2	Table C.4:88	68
Tipper Lorry	50	1	Average of Table C.11:4-20	82

Plant	% on time over 12hr working day	No. of plant	Data Source BS 5228- 1:2009+A1:2014	Activity dB $L_{Aeq,T}$ at 10m
Dozer 20t	80	1	Table C.2:12	81
Articulated Dump Truck	100	4	Table C.4:1	81
360 Excavator 30t	100	2	Table C.2:16	75
Small Roller	60	1	Table C.5:26	77
Vibratory Piling Rig	100	1	Table C.3:8	88
Landfall: TJB construction works within which the offshore export cables are jointed to the onshore export cables				
360 Excavator (45t)	100	1	Table C.2:14	79
General Site Loader	25	1	Table C.4:13	71
Asphalt Spreader	10	1	Table C.5:30	75
Water Pump	25	1	Table C.5:40	68
Diesel Generator	100	2	Table C.4:84	74
Tractor (towing trailer)	25	1	Table C.4.75	79
Diesel Generator	50	1	Table C.4:84	74
360 Excavator (45t)	100	1	BS 5228-1:2009+A1:2014 Table C.2:14	79
Landfall: TJB piling works (Impact 2 Scenario 2.1, 2.2 and 2.3)				
Vibratory Piling Rig	100	1	Table C.3:8	88
Landfall: construction of a temporary access ramp onto the intertidal area				
360 Excavator 30t	60	1	Table C.4:84	75
Articulated Dump Truck	60	3	Table C.4:1	81
Intertidal: intertidal cable duct installation including cable laying				
Diesel Generator	100	1	Table C.4:84	74
Site Lighting	40	4	Table C.4:86	65
Telehandler	80	1	Table C.4:54	79
Tractor (towing trailer)	80	2	Table C4.75	79
Fuel Tanker	10	1	Table C.4:15	76
360 Excavator (45t)	70	2	Table C.2:14	79
Excavator 85 ton with long boom	70	1	Table C7.1	78
Tipper Lorry	80	1	Average of Table C.11:4-20	82
30t Excavator with piling adaptor, (EVM 450)	60	1	Table C4.63	77

Plant	% on time over 12hr working day	No. of plant	Data Source BS 5228- 1:2009+A1:2014	Activity dB $L_{Aeq,T}$ at 10m
De-watering Pump	20	2	Table C.4:88	68
Tensioners including power pack & lighting	30	2	Table C3.12	63
Intertidal: tensioner platforms, rollers and raised equipment storage platform including piling works (impact 3 scenario 3)				
Vibratory Piling Rig	100	1	Table C.3:8	88
Onshore export cable: Tunnel - underground shaft - launch site (impact 4 scenario 4.1, 4.2 and 4.3)				
Crawler crane (100T)	35	1	Table C3.28	67
Telehandler	25	1	Table C.4:54	79
Waste Water Treatment Plant	100	1	Table C.11:2	71
360 Excavator 30t	50	1	Table C.2:16	75
Telehandler	50	1	Table C.4:54	79
Concrete Pump	100	1	Table C.4:25	82
Compressor	100	1	Table C.3:19	75
Power supply, transformers and distribution equipment	100	1	Table C3.12	63
Grout plant & Lubricant	25	1	Table D6.13	80
Waste Water Treatment Plant	100	1	Table C.11:2	71
Wheel Wash	10	1	Table C.3:13	63
Hydraulic power pack for rams	25	1	Table C3.12	63
Onshore export cable: Tunnel - pipe jacking required for the underground tunnelling activities				
Crane (100T crawler)	50	1	Table C3.28	67
360 Excavator 30t	25	1	Table C.2:16	75
Telehandler	50	1	Table C.4:54	79
Muck away	25	1	Table C2.30	79
Slurry Treatment Plant	80	4	Table C.11:2	71
Diesel Generator	100	1	Table C.4:84	74
Diesel Generator	100	1	Table C.4:84	74
Waste Water Treatment Plant	80	1	Table C.11:2	71
Compressor	100	2	Table C.3:19	75
Waste Water Treatment Plant	100	1	Table C.11:2	71
Wheel Wash	10	1	Table C.3:13	63
Onshore substation: general construction activities				

Plant	% on time over 12hr working day	No. of plant	Data Source BS 5228- 1:2009+A1:2014	Activity dB $L_{Aeq,T}$ at 10m
360 Excavator (45t)	100	2	Table C.2:14	79
General Site Loader	25	1	Table C.4:13	71
Telehandler	25	1	Table C.4:54	79
Hiab Delivery	100	2	Table C.4:53	77
Tipper Lorry	100	2	Average of Table C.11:4-20	82
Large Roller	25	1	Table C.5:19	80
Small Roller	25	1	Table C.5:26	77
Dumper 6t	100	1	Table C.4:6	79
Dozer 20t	10	1	Table C.2:12	81
Cement mixer truck (Discharging)	25	2	Table C.4:28	75
Hiab Delivery	25	1	Table C.4:53	77
Diesel Generator	100	1	Table C.4:84	74
Onshore substation: piling works (impact 5 scenario 5)				
Vibratory Piling Rig	66	1	Table C.3:8	88
Impact Piling Rig	66	2	Table C.3:3	88
360 Excavator (45t)	66	1	Table C.2:14	79
Onshore ESBN network cable duct installation (impact 6 scenario 6)				
HDD rig	75	1	Table C4.92	87
General Site Loader	25	2	Table C.4:13	71
Telehandler	25	1	Table C.4:54	79
De-watering Pump	75	1	Table C.4:88	68
Water Pump	75	1	Table C.5:40	68
Diesel Generator	50	2	Table C.4:84	74
Tractor (towing trailer)	25	1	Table C4.75	79

OTI construction phase plant assessment to identify the vibration scenarios

7. **Table 1.3** presents a summary of the vibration levels at reference distances of plant proposed during the OTI construction phase based on the location of the works e.g. landfall, intertidal, onshore cable, onshore substation and ESBN network cables.

8. Scenarios 7 to 11 are identified as vibration scenarios based on the plant operating in the specific works area.

Table 1.3 Summary OTI construction activities and plant, vibration levels (PPV) and scenarios

Description	Vibration levels (PPV)	Highest vibration scenarios ID
Landfall		
Cable duct installation - open cut excavation at landfall	1.49 mm·s^{-1} at 10m	Impact 7 scenario 7 including coffer dam piling
Vibratory piling rigs at landfall or intertidal piling locations.	2.6 mm·s^{-1} at 6m	
Intertidal area		
Excavation at intertidal works area	1.49 mm·s^{-1} at 10m	Impact 8 scenario 8 including tensioner piling
Vibratory piling rigs at tensioner platforms	2.6 mm·s^{-1} at 6m	
Onshore export cables - Tunnel		
Excavation at onshore export cable works	1.49 mm·s^{-1} at 10m	Impact 9 scenario 9
Onshore Substation		
Vibratory piling rigs at anchor wall	2.6 mm·s^{-1} at 6m	Impact 10 scenario 10
Impact piling rigs at combi-wall	1.1 mm·s^{-1} at 6m	
Excavation at onshore substation at opposite end to piling works.	1.49 mm·s^{-1} at 10m	
ESBN network cable works - HDD		
HDD Trenchless crossings (per location)	9 mm·s^{-1} at 10m	Impact 11 scenario 11

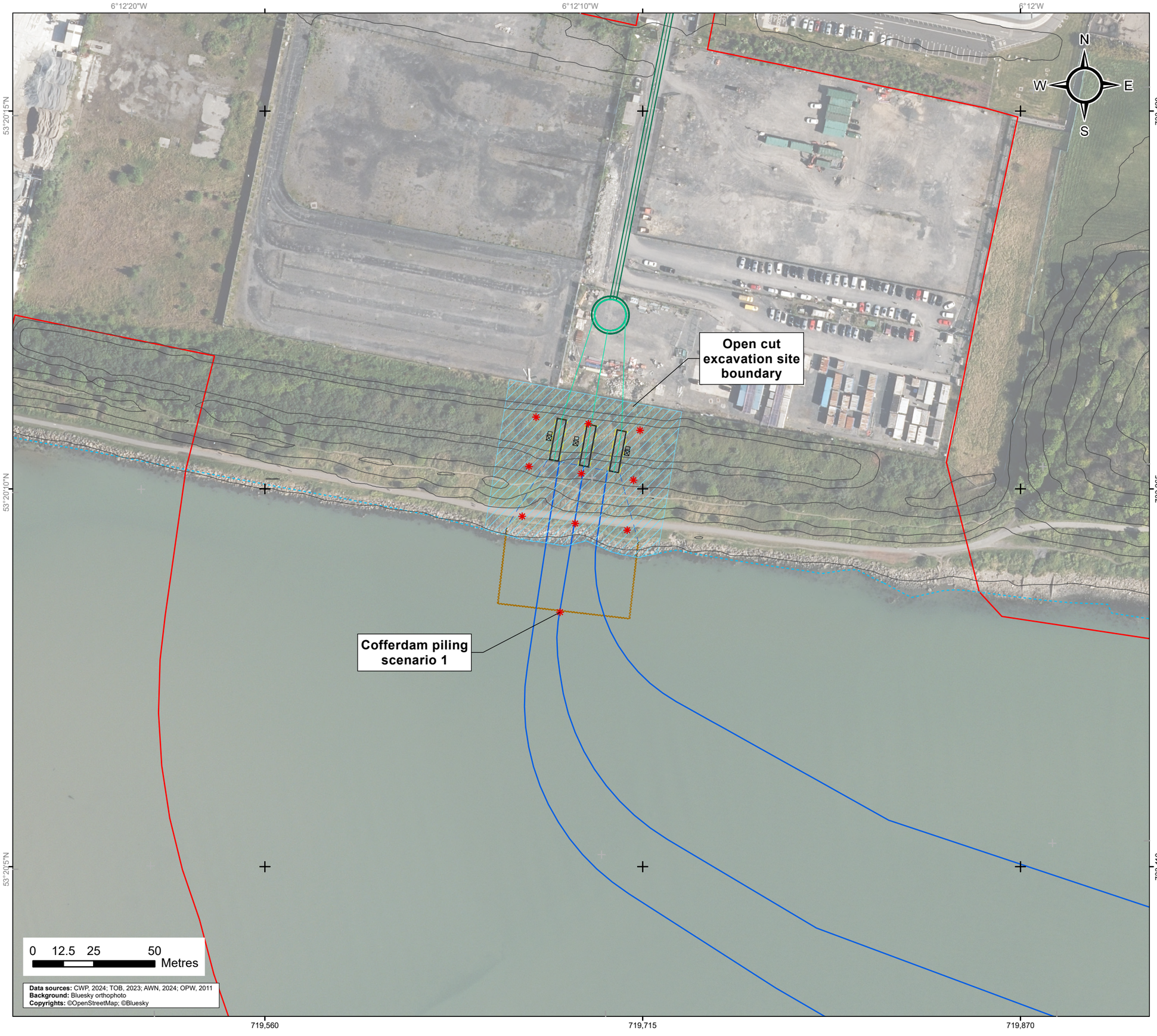
Indicative construction modelling locations for each scenario

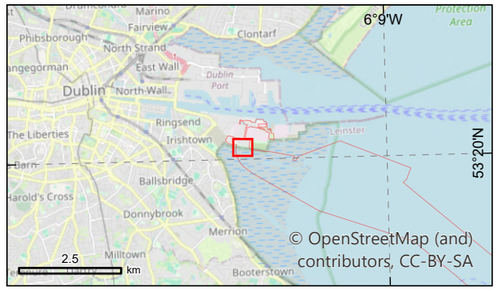
9. The indicative construction modelling locations for each noise impact and scenario are summarised in the table below.

Table 1.4 Indicative construction modelling locations for each impact and scenario

Scenario	WCS activity	Combined Sound Power (L_w) dB (A)	Highest noise scenario
Impact 1 landfall cable duct installation open cut and cofferdam piling cumulative			
1	Open cut excavation including piling works at coffer dam	120	**Impact 1 scenario 1**: Modelled using sound power levels from– open cut. Accounts for open cut at the landfall and also includes for removal of front and rear berms during these works.

Scenario	WCS activity	Combined Sound Power (L_w) dB (A)	Highest noise scenario
			This will be assessed for day, evening and night-time works.





Legend

- Planning application boundary
- High water mark
- Onshore export cable
- Onshore export cable TJB connection
- Offhore export cable
- Temporary cofferdam (open cut cable duct installation)
- Transition joint bay (TJB)
- Topographic contours (2 m interval)
- Landfall works above the HWM
- Offshore export cables (between TJBs and HWM) LoD
- TJBs LoD
- Plant noise sources (averaged)

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Contractor: TOBIN

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Appendix 24.4
Figure 1.1
Cable duct installation (impact 1 scenario 1)

CWP doc. number: CWP-TOB-ENG-08-01-MAP-1658

Internal descriptive code: PB.LF4 -PAB..OECx.3PB.Opt8..OnLoD..COFF..LF4.TWAeHWM..TJBs6..LoD.. NOISE SOURCES..CDOC..OnCx.TJBs6.T.SHAFT..OnC.LF4 to SS.PPT - HWM..OPW.2011.CONT - (EIAR.Vol.04.Ch.24.Ap.04.FIG.01.01)

Size: A3

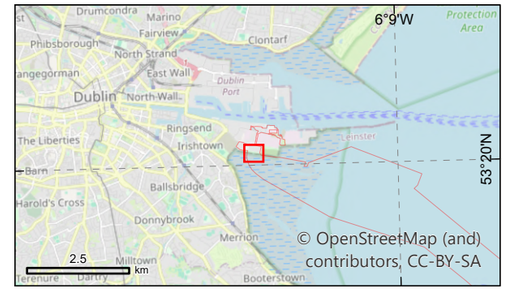
Scale: 1:1,500

CRS: EPSG 2157

Rev.	Updates	Date	By	Chk'd	App'd
00	Final for issue	2024/08/15	SP	DM/EA	ES

Scenario	WCS activity	Combined Sound Power (L_w) dB (A)	Highest noise scenario
Impact 2 landfall TJB piling works			
2	TJB piling works	116	**Impact 2 scenarios 2.1, 2.2** and **2.3**: Modelled using sound power levels from piling works required for the excavation of the TJBs

6°12'20"W
6°12'10"W
6°12'W
53°20'15"N
53°20'10"N
53°20'5"N
733,420
733,265
733,110
719,560
719,715
719,870
N
W
E
S
TJB scenario 2.1
TJB scenario 2.3
TJB scenario 2.2
Open cut excavation site boundary
0 12.5 25 50 Metres
Data sources: CWP, 2023; TOB, 2023; AWN, 2024; OPW, 2011
Background: Bluesky orthophoto
Copyrights: ©OpenStreetMap; ©Bluesky



Legend

- Planning application boundary
- High water mark
- Onshore export cable
- Onshore export cable TJB connection
- Transition joint bay (TJB)
- Offhore export cable
- Topographic contours (2 m interval)
- Landfall works above the HWM
- Offshore export cables (between TJBs and HWM) LoD
- TJBs LoD
- Temporary cofferdam (open cut cable duct installation)
- TJB piling plant sources

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Appendix 24.4
Figure 1.2
Landfall TJB piling works
(impact 2 scenario 2)

CWP doc. number: CWP-TOB-ENG-08-01-MAP-1659

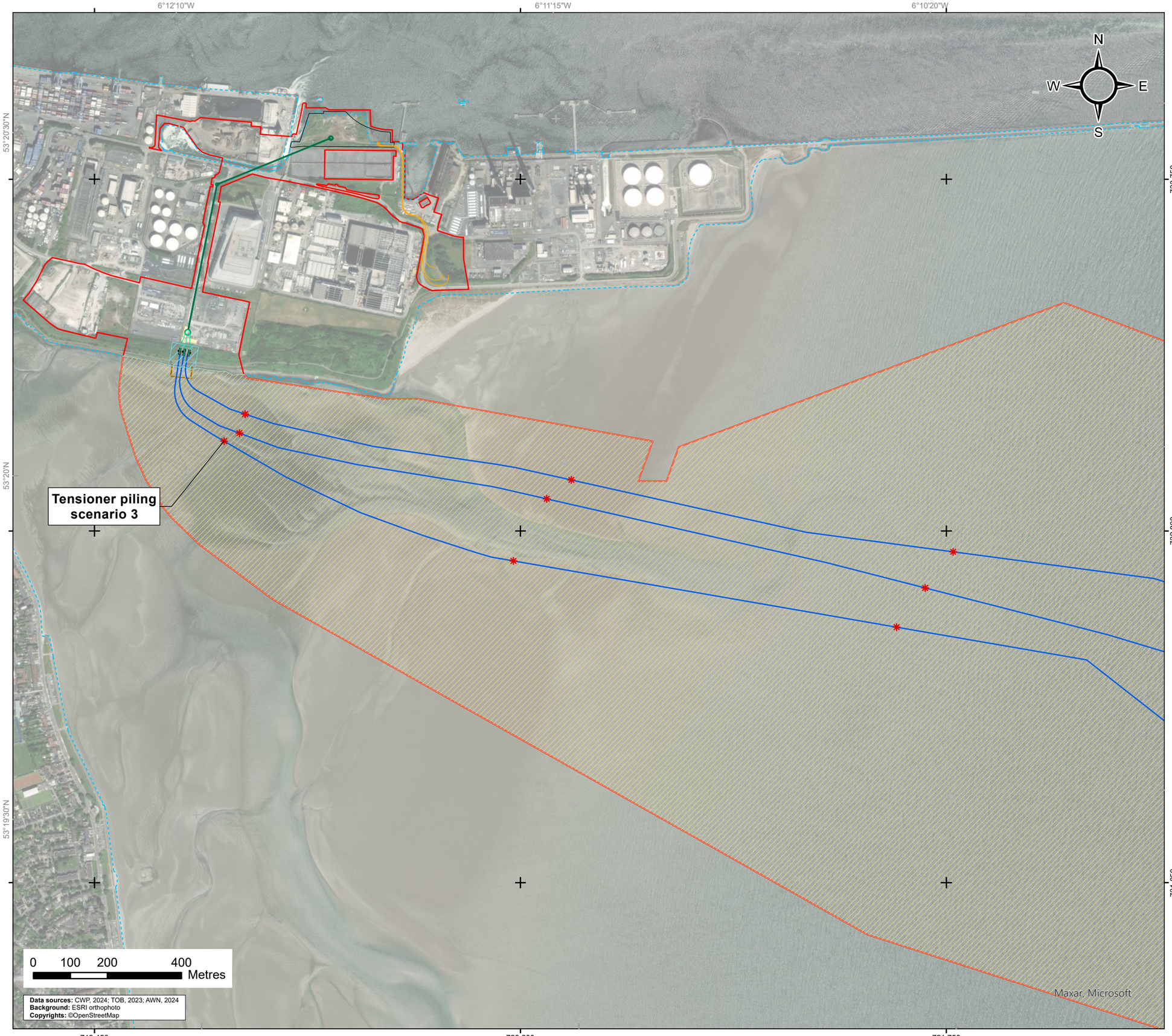
Internal descriptive code:
PB.LF4 - PAB..OECs.3PB.Opt8..OnLcD..COFF..LF4.TWAaHWM..TJBs6..LoD..NOISE.SOURCES.PILING..OnCs.TJBs6.T.SHAFT..OnC.LF4 to SS.PP.T - HWM..OPW.2011.CONT - (EIAR:Vol.04.Ch.24.Ap.04.FIG.01.02

Size: A3
Scale: 1:1,500

CRS: EPSG 2157

Rev.	*Updates*	*Date*	*By*	*Chk'd*	*App'd*
00	Final for issue	2024/08/15	SP	DM/EA	ES

Scenario	WCS activity	Combined Sound Power (L_w) dB (A)	Highest noise scenario
Impact 3 intertidal area tensioner platforms including piling works			
3	Tensioner platforms, rollers and raised equipment storage platform including piling works	116	**Impact 3 scenario 3**: Modelled using sound power levels from piling works at the tensioner platforms in the intertidal area.



Legend

- Planning application boundary
- High water mark
- Onshore export cable TJB connection
- Onshore export cable
- ESBN network cable
- Transition joint bay (TJB)
- Offhore export cable
- Landfall works above the HWM
- Onshore substation boundary (operational)
- Offshore export cables (including cable protection) LoD
- Temporary cofferdam (open cut cable duct installation)
- Tensioner piling plant sources

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Appendix 24.4
Figure 1.3
Intertidal tensioner platforms, rollers and raised equipment storage platform including piling works (impact 3 scenario 3)

CWP doc. number: CWP-TOB-ENG-08-01-MAP-1660

Internal descriptive code:

Size: A3

Scale: 1:10,000

CRS: EPSG 2157

Rev.	Updates	Date	By	Chk'd	App'd
00	Final for issue	2024/08/15	SP	DM/EA	ES

Scenario	WCS activity	Combined Sound Power (L_w) dB (A)	Highest noise scenario
Impact 4 onshore export cables - tunnel			
4.1	Underground shaft - launch site	113	**Impact 4 scenario 4.1**: Modelled using sound power levels from tunnel. This will be assessed for day, evening and night-time works.
4.2	Underground shaft - second site	113	**Impact 4 scenario 4.2**: Modelled using sound power levels from tunnel. This will be assessed for day, evening and night-time works.
4.3	Underground shaft – reception site	113	**Impact 4 scenario 4.3**: Modelled using sound power levels from tunnel. This will be assessed for day, evening and night-time works.

6°12'20"W
6°12'10"W
6°12'W
53°20'45"N
53°20'10"N
733,420
733,265
719,560
719,715
719,870

Tunnel launch site boundary scenario 4.1

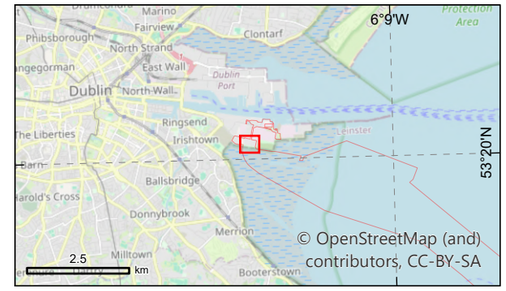
Compound site plant noise sources (averaged)

Launch site plant noise sources (averaged)

N
W
E
S

0 12.5 25 50 Metres

Data sources: CWP, 2024; TOB, 2023; AWN, 2024
Background: Bluesky orthophoto
Copyrights: ©OpenStreetMap; ©Bluesky



Legend

- Planning application boundary
- High water mark
- Temporary tunnel shaft compound
- Onshore export cable TJB connection
- Onshore export cable
- Transition joint bay (TJB)
- Offhore export cable
- Landfall works above the HWM
- Offshore export cables (between TJBs and HWM) LoD
- TJBs LoD
- Temporary cofferdam (open cut cable duct installation)
- Plant noise sources (averaged)

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Appendix 24.4
Figure 1.4
Onshore export cables
tunnel underground shaft -
launch site (impact 4 scenario 4.1)

CWP doc. number: CWP-TOB-ENG-08-01-MAP-1661

Internal descriptive code:
PAB..OECs.3PB.Opt8..OnLoO..COFF..LF4.TWAatHWM..TJBs6.
..LoD..OnCs.TJBs6.TSHAFT..OnC.LF4.to.SS.PPT..COMPs.T..NOISE.SOURCES
- HWM - (EIAR.Vol.04.Ch.24.Ap.04.FIG.01.04)

Size: A3
Scale: 1:1,500

CRS: EPSG 2157

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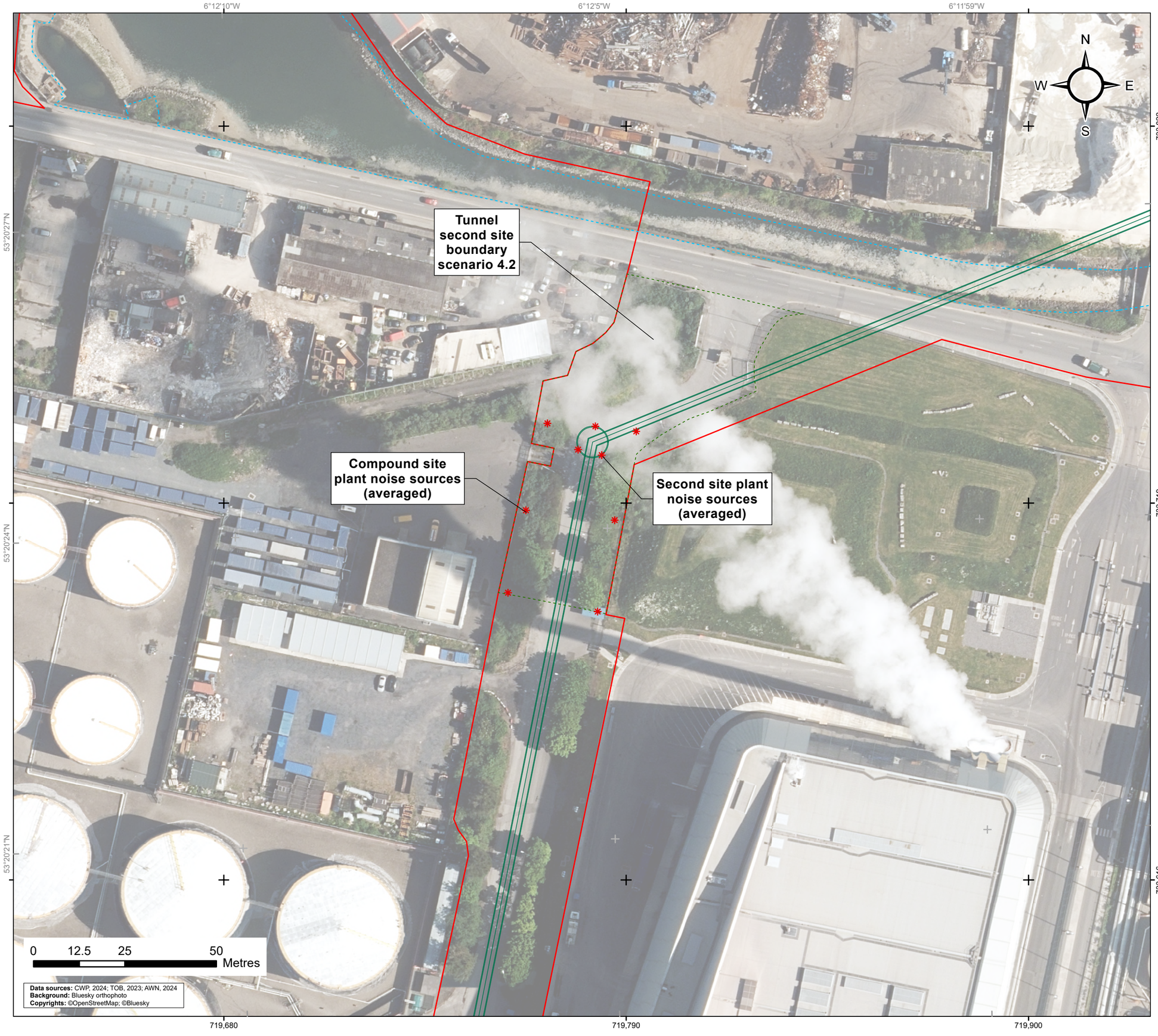

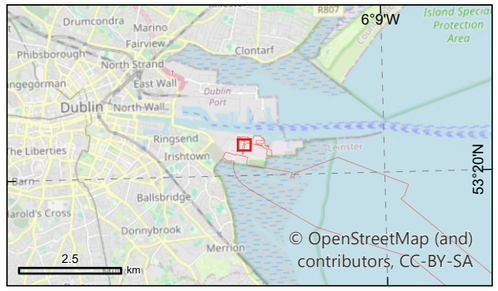

Legend

- Planning application boundary
- High water mark
- Temporary tunnel shaft compound
- Onshore export cable
- Plant noise sources (averaged)

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Appendix 24.4
Figure 1.5
Onshore export cables
tunnel underground shaft -
second site (impact 4 scenario 4.2)

CWP doc. number: CWP-TOB-ENG-08-01-MAP-1662

Internal descriptive code: PB.SHEL.RD - PAB..OnC.LF4.to.SS.PP.T..COMPs.T..NOISE.SOURCES - HWM - (EIAR.Vol.04.Ch.24.Ap.04.FIG.01.05)

Size: A3

Scale: 1:1,000

CRS: EPSG 2157

Rev.	Updates	Date	By	Chk'd	App'd
00	Final for issue	2024/08/15	SP	DM/EA	ES

6°11'50"W

6°11'40"W

53°20'35"N

53°20'30"N

53°20'25"N

734,040

733,885

733,730

720,025

720,180

720,335

N

W

E

S

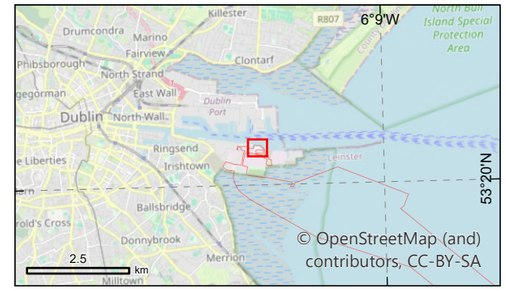
Tunnel reception site boundary scenario 4.3

Compound site plant noise sources (averaged)

Reception site plant noise sources (averaged)

0 12.5 25 50 Metres

Data sources: CWP, 2024; TOB, 2023; AWN, 2024
Background: Bluesky orthophoto
Copyrights: ©OpenStreetMap; ©Bluesky



Legend

- Planning application boundary
- High water mark
- Temporary tunnel shaft compound
- Onshore export cable
- ESBN network cable
- Onshore substation boundary (operational)
- Plant noise sources (averaged)

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Appendix 24.4
Figure 1.6
Onshore export cables
tunnel underground shaft -
reception site (impact 4 scenario 4.3)

CWP doc. number: CWP-TOB-ENG-08-01-MAP-1663

Internal descriptive code:
PB.PP - PAB..OnC.LF4.to.SS.PP.T..SS.PP.PL..ENC..
COMPs.T..NOISE.SOURCES - HWM -
(EIAR.Vol.04.Ch.24.Ap.04.FIG.01.06)

Size: A3
Scale: 1:1,500

CRS: EPSG 2157

Rev.	Updates	Date	By	Chk'd	App'd

Scenario	WCS activity	Combined Sound Power (L_w) dB (A)	Highest noise scenario
Impact 5 onshore substation piling works			
5	Piling works	119	**Impact 5 scenario 5:** Modelled using sound power levels from piling works at the onshore substation.

6°11'57"W
6°11'47"W
6°11'37"W
53°20'35"N
53°20'30"N
53°20'25"N
734,040
733,885
733,730
719,930
720,100
720,270

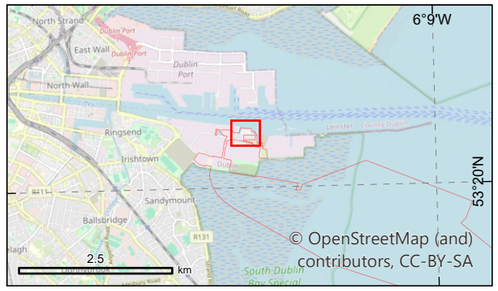
N
W
E
S

Combi wall pilling rigs (x2)

Excavator

0 12.5 25 50 Metres

Data sources: CWP, 2023; TOB, 2023; AWN, 2024
Background: Bluesky orthophoto
Copyrights: ©OpenStreetMap; ©Bluesky



Legend

- Planning application boundary
- High water mark
- Onshore substation electrical layout
- Onshore substation boundary (operational)
- Sheet pile revetment
- Sheet pile revetment LoD
- Plant noise sources

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Appendix 24.4
Figure 1.7
Onshore substation piling works (scenario 5)

CWP doc. number: CWP-TOB-ENG-08-01-MAP-1664

Internal descriptive code: PB.PP - PAB..SS.PP.PL..SS.PP.LO.CIV..RSPW.LoD.. RIVER.WALLS.PILING.NOISE.SOURCES - HWM - (EIAR.Vol.04.Ch.24.Ap.04.FIG.01.07)

Size: A3
Scale: 1:1,500

CRS: EPSG 2157

Rev.	Updates	Date	By	Chk'd	App'd
00	Final for issue	2024/08/15	SP	DM/EA	ES

Scenario	WCS activity	Combined Sound Power (L_w) dB (A)	Highest noise scenario
Impact 6 ESBN network cable works - HDD			
6	HDD Trenchless crossings (per location)	115	**Impact 6 scenario 6:** Modelled using sound power levels from HDD compound and reception compound. Assessment includes for the temporary HDD compound 1 (within Compound C) as the HDD launch compound and general plant in the temporary HDD compound 2 operating simultaneously. This will be assessed for day, evening and night-time works.

6°11'40"W

6°11'30"W

53°20'25"N

53°20'20"N

53°20'15"N

733,730

733,575

733,420

720,180

720,335

720,490

N

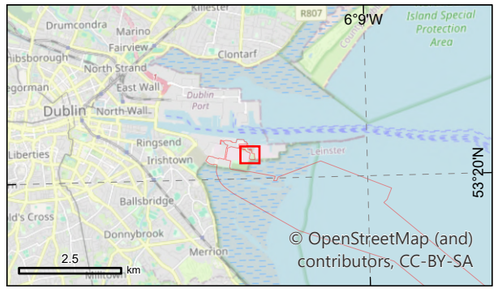
W

E

S

0 12.5 25 50 Metres

Data sources: CWP, 2024; TOB, 2023; AWN, 2024
Background: Bluesky orthophoto
Copyrights: ©OpenStreetMap; ©Bluesky



Legend

- Planning application boundary
- High water mark
- ESBN network cable
- Temporary HDD compound (ESBN network cables)
- Plant noise sources (averaged)

codling wind park

Project: Codling Wind Park

Contractor: TOBIN

Website: www.tobin.ie

Appendix 24.4
Figure 1.8
Onshore ESBN network cable
HDD works (impact 6 scenario 6)

CWP doc. number: CWP-TOB-ENG-08-01-MAP-1665

Internal descriptive code: PB.PH - PAB..ENC..COMPs.ENC..NOISE.SOURCES - HWM - (EIAR.Vol.04.Ch.24.Ap.04.FIG.01.08)

Size: A3
Scale: 1:1,500

CRS: EPSG 2157

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