



AQUIND Limited

AQUIND INTERCONNECTOR

Environmental Statement Addendum – Appendix 18 Construction Noise Impacts on SWBGS Sites

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations
2009 – Regulation 5(2)(a)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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CONSTRUCTION NOISE IMPACTS ON SWBGS SITES

1.1. INTRODUCTION

1.1.1.1. In order to inform appropriate mitigation in relation to Chichester and Langstone Harbours Special Protection Area ('SPA') and associated Solent Wader and Brent Goose Strategy ('SWBGS') sites potentially affected by the Proposed Development, the Applicant submitted an Appendix to the Environmental Statement ('ES') outlining a suite of working principles (Appendix 16.14: Winter Working Restriction for Features of Chichester and Langstone Harbours SPA) (APP-422).

1.1.1.2. Key principles relating to SWBGS in particular included the following:

- PRINCIPLE 1: Construction works cannot take place in SWBGS (those categorised as either core, primary or secondary) sites that overlap with the Proposed Developments Order Limits during October to March, inclusive. An exception is the gravel car park, boat yard and linking roadway within site P11 that is already disturbed by movements of cars, lorries and plant, and offers no functional habitat for brent geese or other waterbirds associated with Chichester and Langstone Harbours SPA.
- PRINCIPLE 2: No buffer zones are applied to SWBGS sites to limit works away from their boundaries, while those sites categorised as 'low use' are also not part of working restrictions.
- PRINCIPLE 7: Regular/consistent construction noise (>70 dB) and irregular/sudden construction noise 60-72 dB implies potential for impacts on the more sensitive species (e.g. Brent geese) and can only occur if effects do not overlap with areas of the SPA identified as supporting this species.

1.1.1.3. As part of their Relevant Representations, Natural England were broadly supportive of the principles applied. There were requests, however, to further consider the assessment of noise impacts:

"Wherever possible, percussive piling or works with heavy machinery (i.e. plant resulting in a noise level in excess of 69dbAmax – measured at the sensitive receptor) should be avoided during the bird overwintering period (i.e. October to March inclusive)."

1.1.1.4. In addition, Natural England recommended the inclusion of low use SWBGS sites into Principle 1.

1.1.1.5. This note therefore investigates the above, including identification of areas of the SWBGS sites which may be exposed to noise levels in excess of 69 dB L_{AFmax} .

1.1.1.6. The note provides commentary on any implications to conclusions made in either the Environmental Statement or Habitat Regulations Assessment ('HRA'). To meet this overarching objective this note therefore presents:

- Construction noise analysis of trenching and HDD works;
- Assessment of implications on low use SWBGS sites;
- Determination of implications of any construction noise of over 69 dB L_{AFmax} on SWBGS and the wider Chichester and Langstone Harbours SPA; and
- Update to winter working principles.

1.2. CONSTRUCTION NOISE ANALYSIS METHODOLOGY

1.2.1. OVERVIEW

1.2.1.1. The Natural England Relevant Representation (RR-181) indicates that the 69 dB criterion refers to a maximum noise level, a parameter expressed as dB L_{AFMax} . Noise levels can be expressed using various parameters, one of which is the maximum noise level, and this is defined as the maximum sound pressure level, which could be for a specific activity or a specified time period.

1.2.1.2. Another noise parameter, expressed as dB L_{Aeq} , is an average of the sound energy measured over a specified time period.

1.2.1.3. The L_{Aeq} parameter is more commonly used to describe construction noise and sound level data contained in British Standard (BS) 5228-1:2014 (the relevant British Standard for construction noise prediction and assessment) are mostly provided in terms of L_{Aeq} values.

1.2.1.4. Whilst there is a discrepancy between the noise parameter used to describe the Natural England criterion and the parameter more commonly used to describe construction noise, it is possible to undertake an assessment to satisfy Natural England's requirements as set-out below.

1.2.1.5. For percussive construction activities (i.e. those such as breaking of a road surface) the L_{Aeq} and L_{AFMax} values are likely to be similar, meaning that the methodology set-out in BS 5228-1 can be used to predict the maximum noise levels for comparison against the Natural England criterion. Therefore, the SWBGS sites potentially affected by noise events in excess of the Natural England 69 dB L_{AFmax} criterion can be evaluated by:

- Identifying the nearby percussive activities during construction works;
- Deriving the L_{AFMax} noise level for each percussive activity by approximating it to the L_{Aeq} value; and

- Calculating the distance from the construction activity whereby the 69 dB L_{AFMax} criterion is likely to be exceeded.

1.2.1.6. The high-level percussive events and associated distances within which the 69 dB criterion is likely to be exceeded are presented in Table 1 below.

1.2.1.7. This approach focusses on the key construction activities that are deemed percussive, as described in NE's Relevant Representation. Maximum noise levels can also be caused by accidental and unexpected events, such as the dropping of equipment. As these events are unexpected, they cannot be accurately predicted. However, the methodology above is considered robust and proportionate as it assesses the maximum noise levels that are expected to occur from the planned construction activities.

1.2.1.8. Indicative 69 dB L_{AFMax} buffers have been produced for trenching activities and Horizontal Directional Drilling ('HDD') sites to establish the extent of any overlap with the nearby SWBGS sites. It is important to note that construction works which are located within SWBGS sites are not part of this analysis as they are already subject to Principle 1 and so cannot be carried out during October to March.

Table 1 – High level percussive events relevant to the Proposed Development

General activity	Specific activity	Sound pressure level (L_P) at 10m	Distance from works (m) within which 69 dB criterion is exceeded
Cable duct installation	Breaking of road surface using a hydraulic pneumatic breaker.	83	50
Cable duct installation	Breaking of road surface with a circular saw.	87	79
Joint Bay excavation	Breaking of road surface using a hydraulic pneumatic breaker.	83	50
Joint Bay excavation	Breaking of road surface with a circular saw.	87	79
HDD sites – site preparation	Excavator mounted vibrator inserting sheet piles for HDD	83	50 ¹

General activity	Specific activity	Sound pressure level (L _p) at 10m	Distance from works (m) within which 69 dB criterion is exceeded
	equipment to attach to.		
HDD 4 – site preparation	Vibratory piling rig inserting sheet piles around edge of pit.	88	89 ¹

1 – This is the expected distance in the absence of any proposed noise mitigation from screening.

1.2.2. TRENCHING

1.2.2.1. Cable duct installation and joint bay excavation along roads involves breaking of the road surface with a circular saw and/or hydraulic pneumatic breaker, and the noise levels for these percussive activities are shown in Table 1. There is the potential for works of this type at the following locations along the route, which are sufficiently close to SWBGS sites for the Natural England criterion to potentially be exceeded:

- 1) Section 8 – Moorings Way, Eastern Avenue and Eastern Road (but excluding the section that passes through a SWBGS site which is subject to Principle 1).
- 2) Section 9 – between HDD-2 and south of Milton Common (i.e. either along Furze Lane and Locksway Road or Longshore Way).
- 3) Section 10 – between landfall and Bransbury Park.

1.2.3. HDD SITES

1.2.3.1. The percussive activities at HDD compounds in proximity to the SWBGS sites are anticipated to comprise the insertion of sheet piles via an excavator mounted vibrator at HDD-1, HDD-2, HDD-3 and HDD-6 and via a piling rig for the reception pit at HDD-4 (north of railway). The noise levels for these activities are shown in Table 1.

1.2.3.2. In accordance with the requirements of the Onshore Outline Construction Environmental Management Plan ('CEMP'), screening at least 2 m high around the perimeter of the HDD compounds is required for the purpose of noise mitigation. The benefit this screening affords has been included in 3D noise modelling for the HDD works in proximity to the SWBGS sites.

HDD-1, HDD-2 and HDD-3

1.2.3.3. At HDD-1, and HDD-2, the 3D noise modelling has demonstrated that, with the inclusion of the noise barrier, the 69dB L_{AFmax} noise level from sheet piling will not impact the proximate SWBGS sites or Chichester and Langstone Harbours SPA. There is therefore no restriction on HDD at these locations.

1.2.3.4. At HDD-3, the 3D noise modelling has also demonstrated that with the inclusion of the noise barrier, the 69dB L_{AFmax} noise level is within the site compound at this location. The extent of the 69 dB buffer is shown in Appendix 3. The site compound at HDD-3 lies within the P11 SWBGS. This is however composed entirely of hardstanding and not suitable for foraging / roosting brent geese or other waterbirds associated with the SPA. The use of this area for construction activities for the Proposed Development has been agreed with Natural England through a Statement of Common Ground (document reference 7.5.11) and as stated in their Relevant Representation (RR-181).

HDD-4 (reception pit) and HDD-6

1.2.3.5. At HDD-4 and HDD-6, the 69dB L_{AFmax} buffer from sheet piling lies outside of the site compounds. The extent of the 69 dB buffers are shown in Appendix 3.

1.3. ASSESSMENT

1.3.1. LOW USE SITES

1.3.1.1. Appendix 1 shows the locations of all SWBGS sites in the vicinity of the Proposed Development. No 'low use' sites lie within the Order Limits. It is therefore not necessary to amend Principle 1 to include low use sites as requested by Natural England.

1.3.1.2. Two low use sites, namely P19A and P19E are located immediately adjacent to the Order Limits, within a complex of SWBGS sites north of Milton Common.

1.3.1.3. All other low use SWBGS sites are a notable distance from the Proposed Developments Order Limits. Based on known sensitivity of dark-bellied brent geese to noise and visual disturbance (i.e. known to be sensitive up to a maximum of 400m from sources of visual disturbance) these sites will not be impacted by the Proposed Development.

1.3.1.4. The potential for construction noise effects at SWBGS sites including P19A and P19E is analysed in Section 1.3.2 below.

1.3.2. CONSTRUCTION NOISE

Trenching

1.3.2.1. Appendix 2 presents indicative construction noise at 69 dB L_{AFmax} from trenching / road saw cutting works and its potential overlap with SWBGS sites and the SPA. Table 2 presents an overview of each SWBGS site and an assessment of potential impacts and whether a restriction of construction work during October – March would be mandated by adapted the Principles to follow the advice from Natural England.

Table 2 – Trenching and road saw noise impacts on SWBGS sites

SWBGS Site	Status	Location	Winter Working Restriction	Justification
P84	SPA	Eastern Road (east side)	✓	Complete overlap of site with noise effects of 69 dB or over
P12	Core	Eastern Road (west side)	✓	Overlap of roadside portion of this extensive SWBGS with noise effects of 69 dB or over
P19A	Low use	Eastern Road (west side)	✓	Overlap of roadside portion of this SWBGS with noise effects of 69 dB or over
P19B	Secondary support	Eastern Road (west side)	✓	Overlap of roadside portion of this SWBGS with noise effects of 69 dB or over
P19D	Primary support	Eastern Road (west side)	✓	Overlap of roadside portion of this SWBGS with noise effects of 69 dB or over
P19E	Low use	Eastern Road (west side)	✓	Overlap of roadside portion of this SWBGS with noise effects of 69 dB or over
P83	SPA	Eastern Road (east side)	✓	Complete overlap of site with noise effects of 69 dB or over

SWBGS Site	Status	Location	Winter Working Restriction	Justification
P52	Core	Eastern Road (west side)	✓	Substantial overlap of site with noise effects of 69 dB or over
P23A	Core	Eastern Road (east side)	✓	Substantial overlap of site with noise effects of 69 dB or over
P23R	Core	Eastern Road (east side)	✓	Substantial overlap of site with noise effects of 69 dB or over
P54	Core	Eastern Road (west side)	✗	Minimal overlap of SWBGS of noise effects of 69 dB or over
P25	Secondary support	University of Portsmouth	✓	Substantial overlap of site with noise effects of 69 dB or over
P23B	Core	Furze Lane	✓	Substantial overlap of site with noise effects of 69 dB or over
P29	Core	Fort Cumberland Road / Bransbury Road	✗	Overlap of noise effects minimal on SWBGS which in any case is screened by buildings.

- 1.3.2.2. Table 2 outlines that construction works that produce noise effects exceeding Natural England’s proposed 69 dB threshold overlap with multiple SWBGS sites. Therefore, without avoidance or mitigation there is potential for disturbance impacts on brent geese using these sites. In order to avoid an adverse effect on integrity to Chichester and Langstone Harbours SPA it is prescribed that construction works cannot take place in the non-breeding season (October to March inclusive) that overlap with all SWBGS sites with the exception of P54 and P29.
- 1.3.2.3. It is considered that Principle 6 as outlined in Appendix 16.14 of the ES (APP-422) is likely to be relevant along most of the cable route, particularly along Eastern Road. Principle 6 states that *‘Construction works of 55 – 72 dB immediately adjacent to a major road and/or adjacent to industrial sites with notable levels of background noise can be undertaken unrestricted. It is considered that noise levels from the Proposed Development would be masked in these instances.’* It is considered likely that ‘notable’ levels of background noise (defined as >60 dB by Cutts, Hemingway and Spencer 2013¹) occur in the urban environment within which the cable route is situated. Due to the extensive overlap (in some cases) of 69 dB noise levels, a precautionary position is taken by restricting works to outside of the non-breeding season through the adaptation of Natural England’s proposed update to Principle 7.
- 1.3.2.4. SWBGS sites P54 and P29 are excluded from the restriction due to the minimal overlap of the site areas with noise exceeding 69 dB from trenching / road saw works. It is also considered that the buildings that are situated between the construction works and SWBGS sites will effectively buffer the noise so that in reality, there will be no overlap in noise effects.
- 1.3.2.5. Overlap with the Chichester and Langstone Harbours SPA and noise of above 69 dB from trenching / road saw construction works is limited to two areas as indicated in the figure in Appendix 2. These two areas are:
- Eastern Road; and
 - Milton Locks and Longshawe Way.
- 1.3.2.6. As highlighted above, works on Eastern Road are restricted during October – March due to noise overlap with SWBGS. Therefore, the only additional area of the Onshore Cable Route that is subject to a winter working restriction is that of Milton Locks and Longshawe Way.

¹ Cutts, N, Hemingway, K & Spencer, J (2013). Waterbird Disturbance Mitigation Toolkit. Institute of Estuarine & Coastal Studies (IECS), University of Hull.

HDD

- 1.3.2.7. Appendix 3 presents indicative construction noise from HDD-4 and HDD-6 at 69 dB L_{AFmax} with noise barriers and its potential overlap with SWBGS sites. Appendix 3 indicates that:
- HDD-4 –there is no overlap with the P08 SWBGS at 69 dB L_{AFmax}
 - HDD-6 – there is marginal overlap with P23A SWBGS
- 1.3.2.8. Therefore, potential overlap of with the SWBGS sites of 69 dB L_{AFmax} noise levels (involving inserting sheet piles) is restricted to the HDD-6. The overlap with P23A is extremely limited although as the compound for HDD-6 lies within the SWBGS it is already subject to winter working restriction through the application of Principle 1.
- 1.3.2.9. There are no implications for the Chichester and Langstone Harbours SPA as a result of HDD works.

1.4. DISCUSSION

- 1.4.1.1. It is demonstrated that after consideration of mitigation measures and the application winter working principles for construction of the Proposed Development there will be no impact to either SWBGS sites or the SPA from either HDD or trenching / road saw operations.
- 1.4.1.2. With the exception of HDD-3 and HDD-6, HDD works will not impact SWBGS following the application of noise barriers which will prevent any noise effects of over 69 dB reaching SWBGS sites. HDD-3 noise levels will not extend beyond the site compound and therefore only impact hardstanding habitat and not effecting the integrity of the SWBGS. Noise levels from HDD-6 marginally overlap with the P23A SWBGS. However, as the HDD compound lies within the SWBGS, it is already subject to Principle 1 so that winter work (October to March inclusive) is restricted.
- 1.4.1.3. Noise levels from trenching and road saw cutting works of over 69 dB L_{AFmax} includes overlap with multiple SWBGS sites and therefore leads to the potential for impacts through disturbance on brent geese. To prevent any adverse impacts on the integrity of the SWBGS (and to follow Natural England’s advice) a restriction of construction working during October to March for all sites highlighted with the exception of P54 and P29 is mandated.
- 1.4.1.4. Trenching and road saw cutting works are also restricted at Milton Locks and Longshore Way due to the potential for noise levels of over 69 dB L_{AFmax} to occur within intertidal habitat of Chichester and Langstone Harbours SPA.
- 1.4.1.5. On the basis of the assessment of impacts from HDD and trenching / road saw construction works, a conclusion of no significant effects on the SWBGS network is reached and there is considered to be no adverse effect on the integrity of Chichester and Langstone Harbours SPA.

1.5. REVISED PRINCIPLES

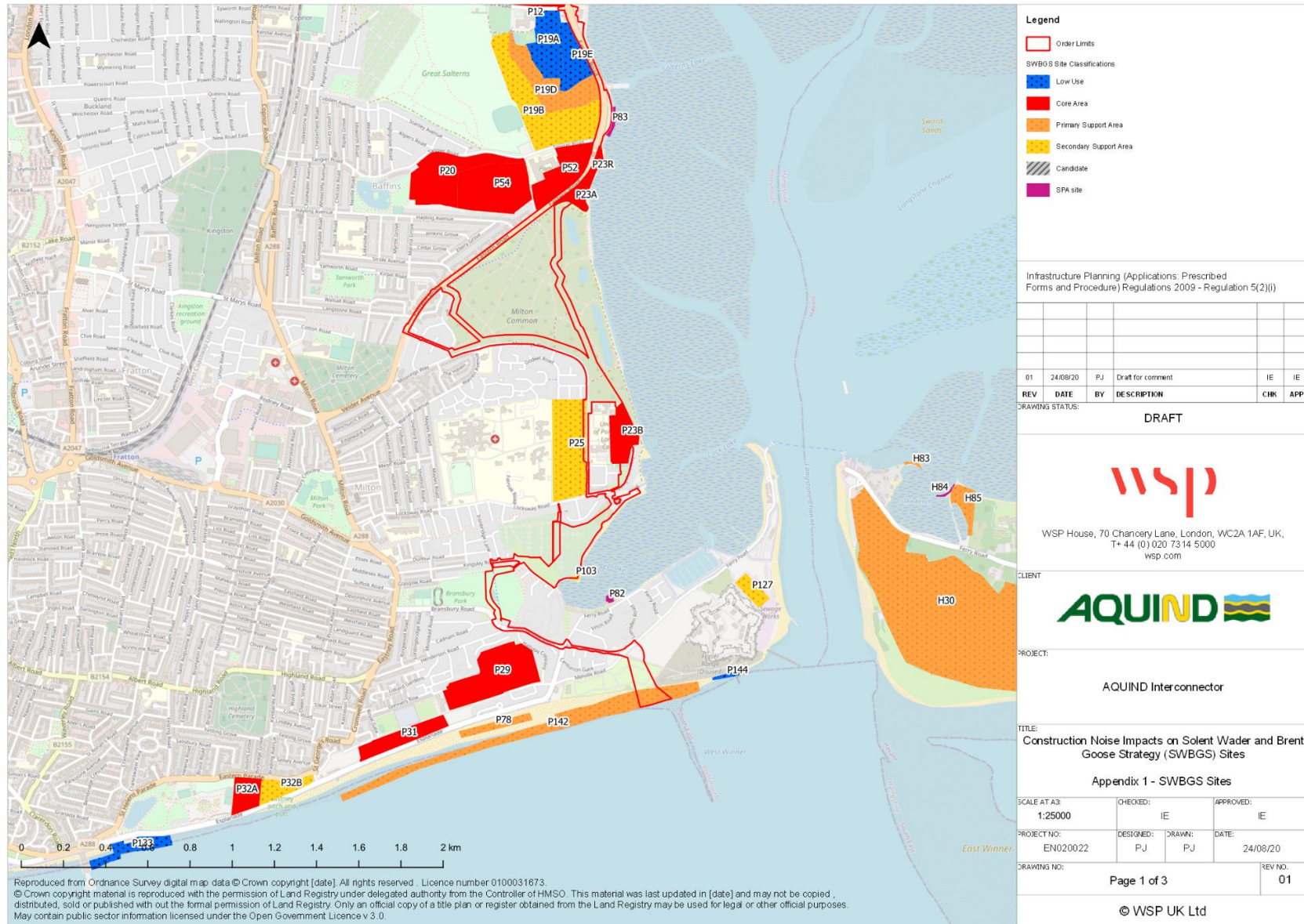
1.5.1.1. This restrictions to construction work detailed in this note will be subject to inclusion in the updated Onshore Outline CEMP (APP-505 Rev002) and agreement with Natural England in the Statement of Common Ground.

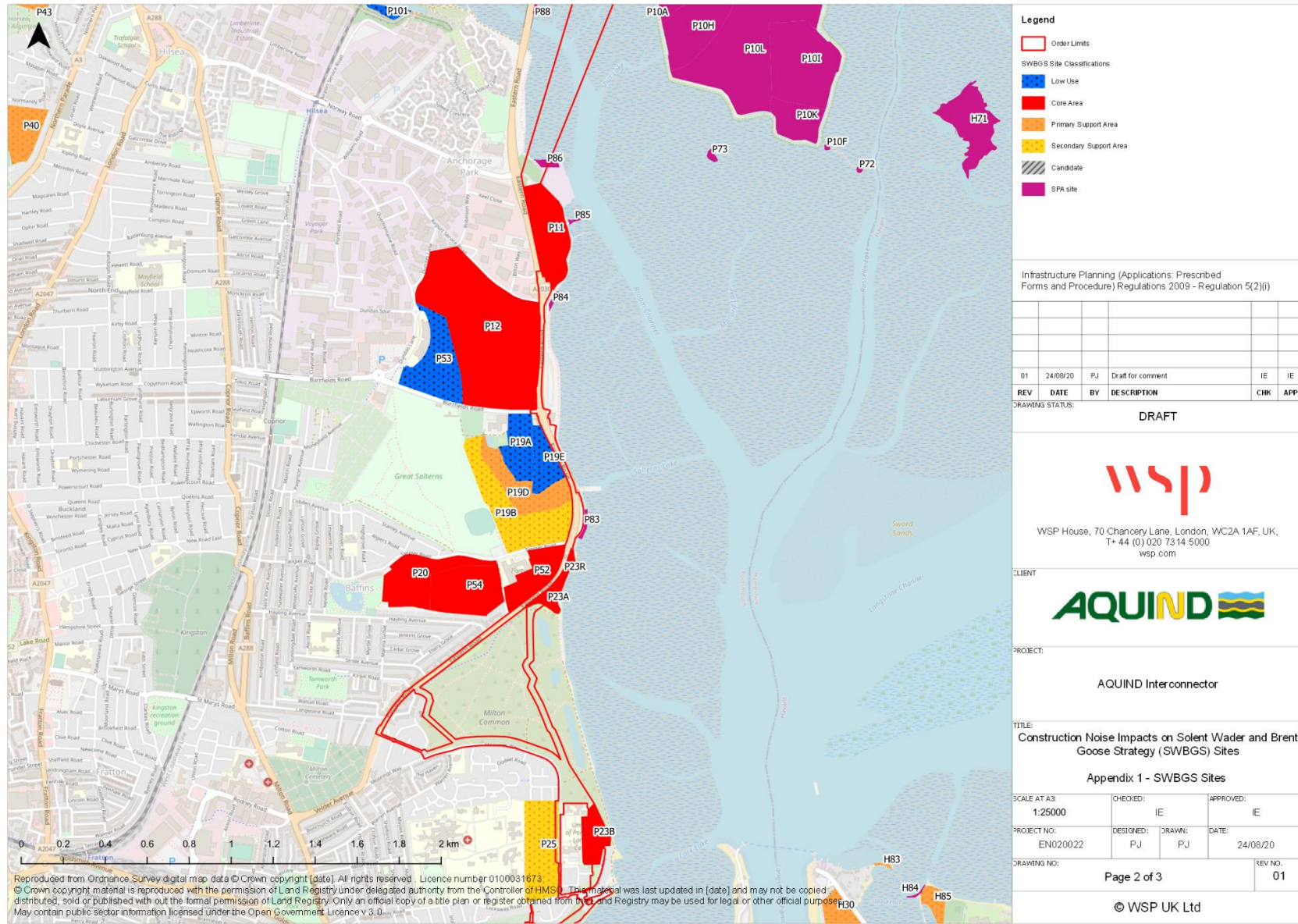
1.5.1.2. The consideration of Natural England's advice and the analysis undertaken in this note allows a revision of the winter working principles as follows:

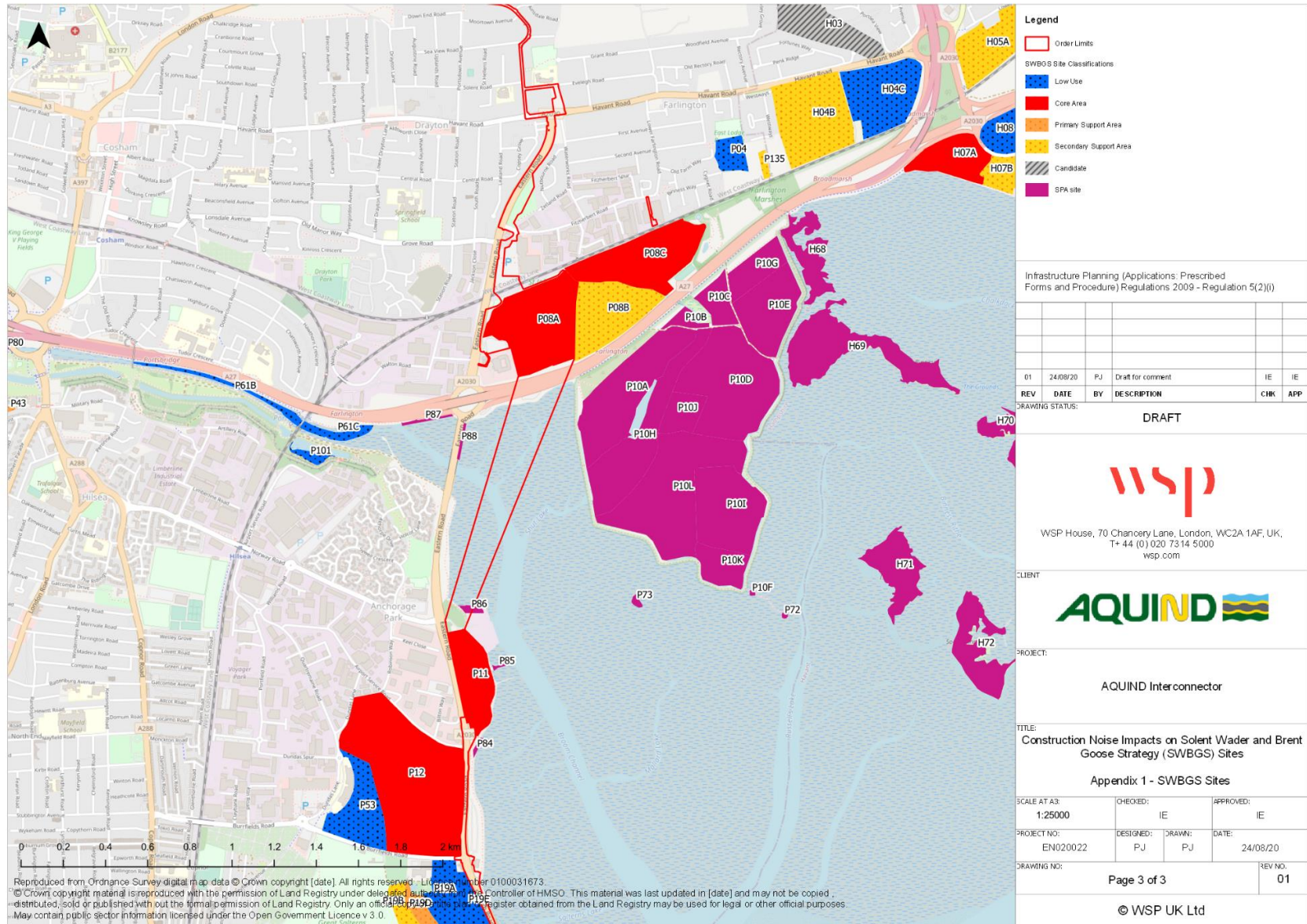
- **Principle 1:** Construction works cannot take place in SWBGS (those categorised as either core, primary support, secondary support, low use or candidate) sites that overlap with the Proposed Developments Order Limits during October – March. An exception is the gravel car park within site P11 that is already disturbed by movements of cars, lorries and plant, and offers no functional habitat for brent geese or other waterbirds associated with Chichester and Langstone Harbour SPA.
- **Principle 2:** Where HDD works are to take place underneath the SWBGS site (e.g. at Eastney Landfall) no direct impacts are considered to occur and the restriction does not apply.
- **Principle 3:** Elements of the Onshore Cable Route that are over 400 m from the SPA are not subject to any restriction.
- **Principle 4:** Construction noise events of <55 dB can occur unrestricted.
- **Principle 5:** Construction works of 55 – 72 dB L_{AFmax} immediately adjacent to a major road and/or adjacent to industrial sites with notable levels (>60 dB) of existing noise can be undertaken unrestricted. It is considered that noise levels from the Proposed Development would be masked (i.e. indistinguishable from the baseline) in these instances.
- **Principle 6:** Wherever possible, percussive piling or works with heavy machinery (i.e. plant resulting in a noise level in excess of 69 dB L_{AFmax} – measured at the sensitive receptor) should be avoided during the bird overwintering period (i.e. October to March inclusive. The sensitive receptor is the nearest point of the SPA or any SPA supporting habitat (e.g. high tide roosting site). P54 and P29 are excluded from this principle. Buildings that are situated between them and the construction works will buffer noise such that it will not be in excess of 69 dB L_{AFmax} within either site.

1.5.1.3. The revised principles are also be captured in the updated Onshore Outline CEMP (APP-505 Rev002)

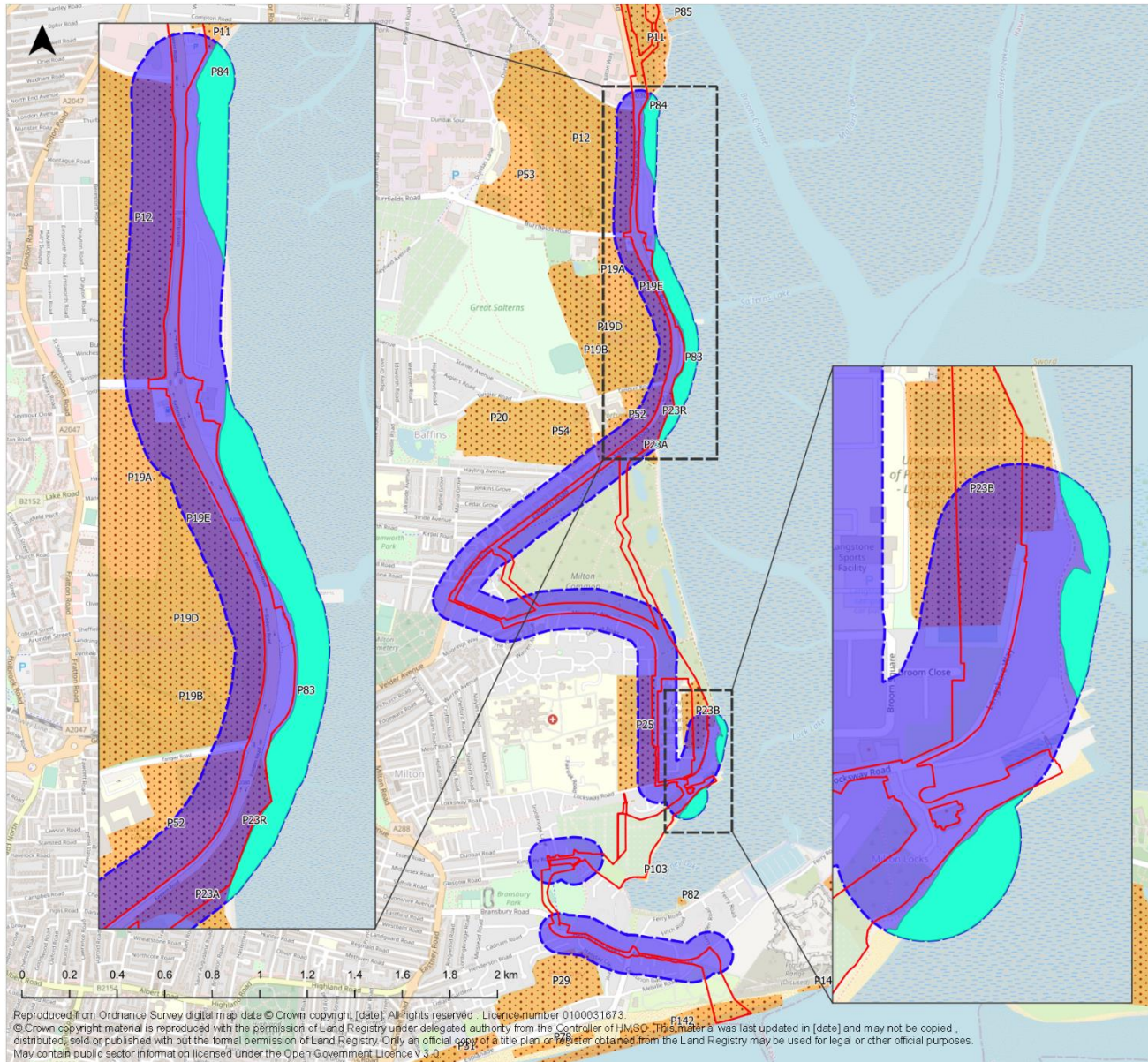
Appendix 1 – SWBGS Site Locations







Appendix 2 – Potential Trenching Construction Noise overlap with SWBGS and the SPA



Legend

- Order Limits
- SWBGS Sites (2017 Revision)
- 69dB Noise Contour - Road Saw Cutting

Infrastructure Planning (Applications, Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(i)

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Appendix 3 – Potential HDD Construction Noise overlap with SWBGS

