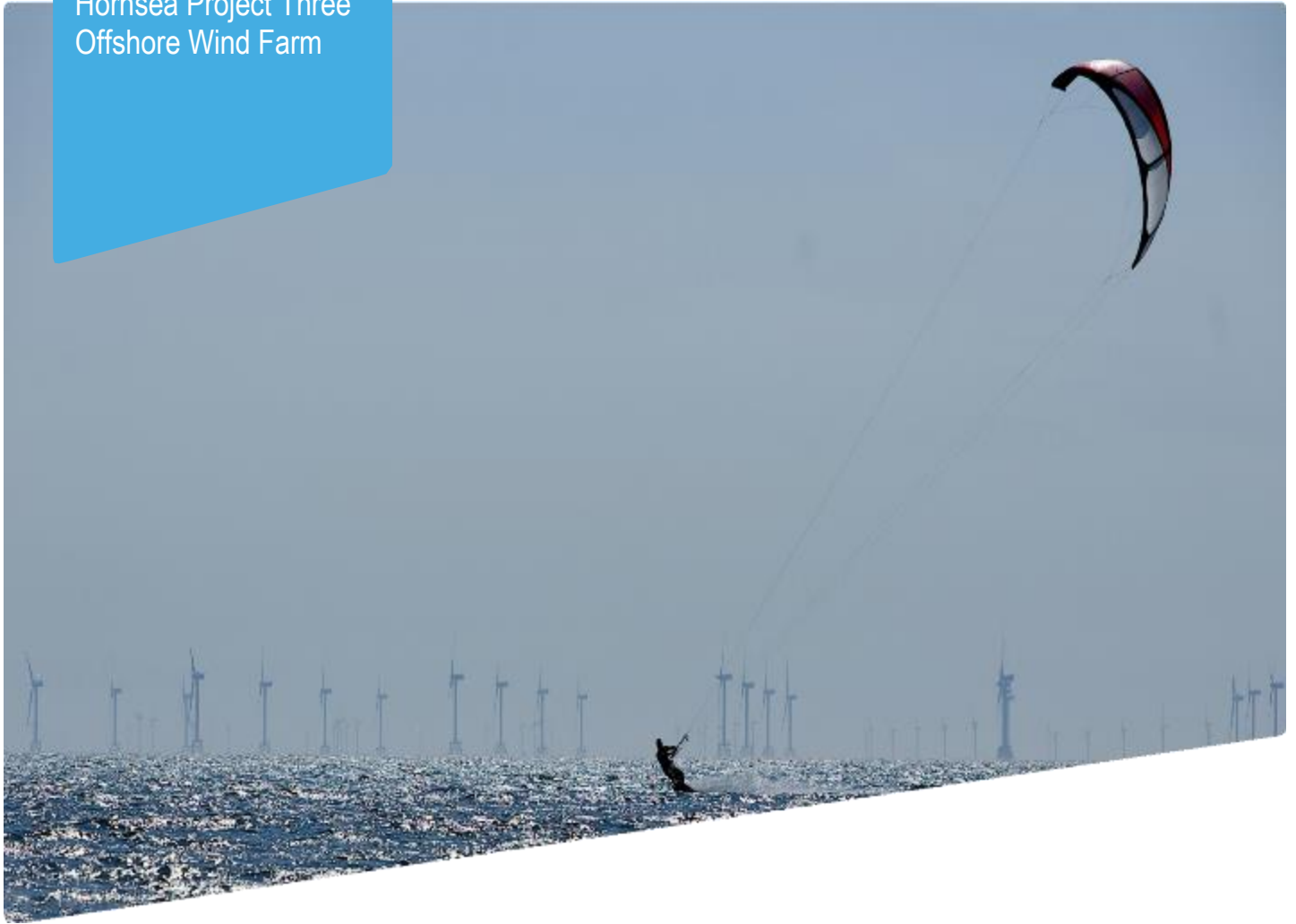


Hornsea Project Three  
Offshore Wind Farm



## Hornsea Project Three Offshore Wind Farm

Appendix 5 to Deadline 10 submission -  
Aviation Summary Statement

Date: 1 April 2019

Hornsea 3  
Offshore Wind Farm

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Front cover picture: Kite surfer near a UK offshore wind farm © Ørsted Hornsea Project Three (UK) Ltd., 2019.

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## 1. Introduction

- 1.1 The purpose of this document is to set out the Applicant's final position with respect to the Aviation impacts on the Spirit Energy assets, as assessed within Volume 2, Chapter 8: Aviation, Military and Communication of the Environment Statement (APP-113).
- 1.2 The Applicant has consulted with Spirit Energy through the pre-application phase to both inform the assessments and to address issues raised by Spirit Energy (previously Centrica) during Section 42 consultation on the Preliminary Environmental Information Report (PEIR). Post application, the Applicant and Spirit Energy have engaged extensively and have been able to make considerable progress in reaching agreement on the technical issues arising in Spirit Energy's relevant representations submitted at Deadline 1 (RR-107, RR-108 and RR109).
- 1.3 For clarity, the key consultation meetings have been summarised by the Applicant in the table in Appendix A. The table identifies the main objectives of each meeting, the outcomes, and how these have fed into the examination process.
- 1.4 The two parties have worked together using a common data set to agree the assumptions used within the assessments and the methodology to such an extent that they are now able to agree on the percentage of time that flights to the Spirit Energy assets, the Chiswick and Grove platforms, are potentially restricted by Hornsea Three to within 1.5%.
- 1.5 The fundamental areas where alignment has been reached in order to arrive at this position include:
- Agreement has been reached on the regulations underpinning the assessments, namely the EASA regulations;
  - Agreement has been reached on the availability of alternative flights to the platforms, that can be flown within the regulations, that being an en route descent and a shuttle flight and a circling ARA.
  - Agreement has been reached on the use of a common data set for assessing the percentage of days restricted,
  - Agreement has been reached on the weather conditions which require an ARA flight to be flown.
- 1.6 The Applicant has, in the spirit of co-existence, provided an offer to Spirit Energy of a 2.8 nm exclusion zone around the Chiswick platform to enable a greater degree of flexibility for both approaches and take offs from the platform. This has enabled the outcome of the percentage of time that flights are potentially restricted by Hornsea Three to become aligned to the degree set out above (i.e. agreement to within 1.5%).
- 1.7 The 2.8 nm buffer has been proposed based on consultation during the examination phase and the Applicant's understanding of the concerns raised by Spirit Energy. This buffer achieves this as it:

- Provides for a circling ARA which requires an agreed footprint of 2.42 nm; and
- Provides for missed approach procedures with one engine inoperable (OEI), for all instances that ARA are available, of 1.82 nm; and
- Provides for a worst case take with engine failure on take off, with an agreed footprint of 1.81 nm (and a 1 nm IMC buffer).

1.8 Spirit Energy whilst agreeing to the footprints presented by the Applicant (REP7-056) have caveated their position based on the requirement for validation by helicopter operators and simulation trials for the evaluation of pilot workload and environmental factors such as turbulence. The Applicant agrees with Spirit Energy that the footprints should be validated by the helicopter operators and has worked with Spirit Energy to ensure that this process has been followed.

1.9 Notwithstanding the good progress made, there are areas of disagreement which remain, which are briefly summarised below and discussed in more detail in section 2 below.

- The requirement for validation of the footprints by the use of a simulator trial to test pilot workload, as no further information will be provided;
- The requirement for validation of the footprints by the use of a simulator trial to test environmental factors such as turbulence as this is not achieved by a simulator;
- The effect of the flight restrictions on Spirit Energy operated assets having a significant safety effect, as these are NUIs with a degree of restricted access and with available means of evacuation;
- Consideration that the Spirit Energy operated subsea wells require the same degree of access as to the above sea platforms, as they are designed to require infrequent access, access is principally by vessel and helicopter access remains available within applicable weather minima to the vessel.

## 2. Aviation Summary Position Statement

2.1 The Applicant has undertaken aviation assessments within the Environmental Statement which comply with the EIA regulations and have regard for the Overarching National Policy Statement for Energy (EN-1), National Policy Statement for Renewable Energy Infrastructure (EN-3) and CAP 764.

2.2 Section 8.11, Volume 2, Chapter 8: Aviation, Military and Communication of the Environment Statement (APP-113) presents an assessment of whether the project results in a change to the ability to carry out operations safely, and has taken consideration of EN-3, paragraphs 2.6.183 and 2.6.184, in that no unacceptable risk has been introduced by Hornsea Three.

- 2.3 The Applicant has identified a restriction in the ability to conduct straight in Airborne Radar (ARA) approaches (including the ability to carry out a Missed Approach Procedure or One Engine Inoperative (OEI) in certain weather conditions to the Spirit Energy operated assets Chiswick platform and Grove platform (APP-113). Aviation regulations ensure risk is managed for each planned flight and the helicopter operator will only fly within these regulations. The project may result in the requirement not to fly, or to fly a different flight path, but always within the regulations, therefore resulting in no change to safety risk in regard to helicopter approaches to Spirit Energy platforms.
- 2.4 The Applicant sought to explain why their assessment and that of Spirit Energy differ so significantly (see the Applicant's response to ExA Q2.5.14 at Deadline 4; REP4-012). There were four fundamental differences identified which are discussed below.
- The application of applicable regulations to the assessments;
  - The availability of approaches other than a straight in ARA;
  - The amount of times IMC conditions require an ARA; and
  - Consideration of operational effect of flight restrictions to Spirit Energy operated assets.

### **Application of appropriate regulations to the assessments**

- 2.5 The first difference was in the application of the regulations and the assumptions used to underpin the assessments fundamentally the application of the European Aviation Safety Agency (EASA) regulations by the Applicant, which provide the legal basis for aviation operations in Europe, as opposed to the Oil and Gas helicopter guidance document referred to by Spirit Energy, the International Oil and Gas Aviation Management Guide (IOGP AMG). The Applicant requested the regulations and assumptions used by Spirit Energy in order to facilitate agreement at the 17 December 2019 workshop however these were never provided. The Applicant's Environmental Statement has been demonstrated to be robust in that the regulations which should be used to underpin the assessments are indeed EASA as used by the Applicant and not IOGP as used by Spirit Energy Which has now been agreed by Spirit Energy (REP9-053).

### **The availability of approaches other than a straight in ARA**

- 2.6 The second difference was in the difference of opinion that there are alternative flights to a straight in ARA that can be flown within the EASA regulations; namely an en route descent and a shuttle flight which both can be used to provide safe access to the destination platforms. The Applicant's Environmental Statement has been demonstrated to be robust, with the meeting with CHC and other helicopter operators confirming that the alternative flight options put forward by the Applicant were correct.

- 2.7 The meeting with CHC and the aviation workshop confirmed that the en route descent as put forward by the Applicant, is the preferred approach to an ARA when the weather conditions permit which is for most of the time (77% of the time; see Appendix 3 to the Applicant's response to Deadline 10) as can be shown in Figure 2.1. This enables an approach to be made from any wind direction to the Chiswick and Grove Platforms, as long as there is VMC between 600 ft and the surface.

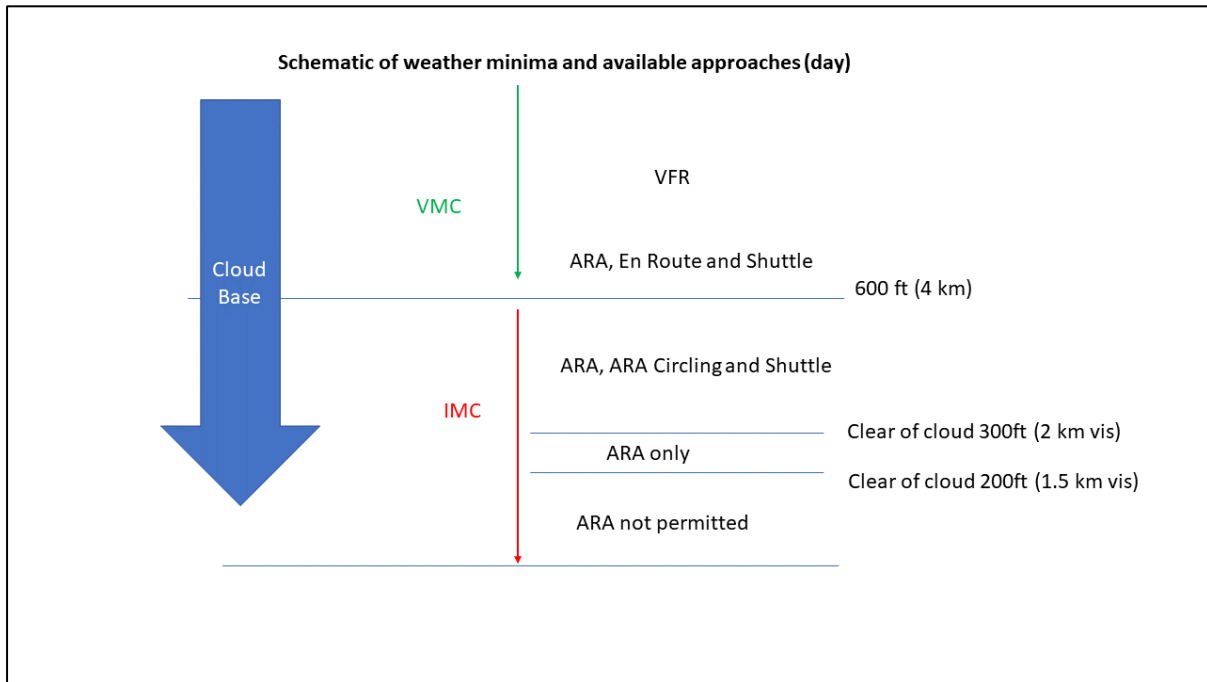


Figure 2.1: Schematic of weather minima and available approaches

- 2.8 The meeting with CHC and the aviation workshop confirmed that shuttle flights as put forward by the Applicant, and not considered by Spirit Energy, can be (and routinely are) flown from the J6A platform to the Chiswick and Grove platforms, for flights originating from Den Helder when routing via the J6A platform.
- 2.9 An ARA can be made to the J6A platform and from there, shuttle flights can be flown to the Chiswick and Grove platforms as these platforms are less than 10 nm from the J6A platform and so are within the regulations for shuttle flights. The IMC conditions for shuttle flights (by day) are for a cloud base as low as 300 ft and visibility of 2 km (for 87 % of the time; see Appendix 3 to the Applicant's response to Deadline 10) and allow a greater degree of access to the Chiswick and Grove platforms as shown in Figure 2.1.
- 2.10 The Applicant identified a small, not significant increase in the number of days that flights would be restricted to the Chiswick and Grove platforms when only ARA flights are required (i.e. 7.9%; see Appendix 3 to the Applicant's response to Deadline 10) which is for a small percentage of time as show in Figure 2.1, as stated in the Environmental Statement and validated through the Examination (see REP7-040 and REP9-051, with an updated version at Appendix 3 to the Applicant's response to Deadline 10).

- 2.11 One of the outcomes of the aviation workshop was that the Applicant and Spirit Energy were advised that in the instances when an ARA is required the helicopter operators reported that a circling ARA could be flown. This allows the final segment of the ARA to be flown out of wind, and a circle into land at a final approach fix of up to 2 nm (VMC approach for night) to be made. The Applicant, as an action from the helicopter workshop, prepared a circling ARA footprint(REF7-056) as shown in Figure 2.2.

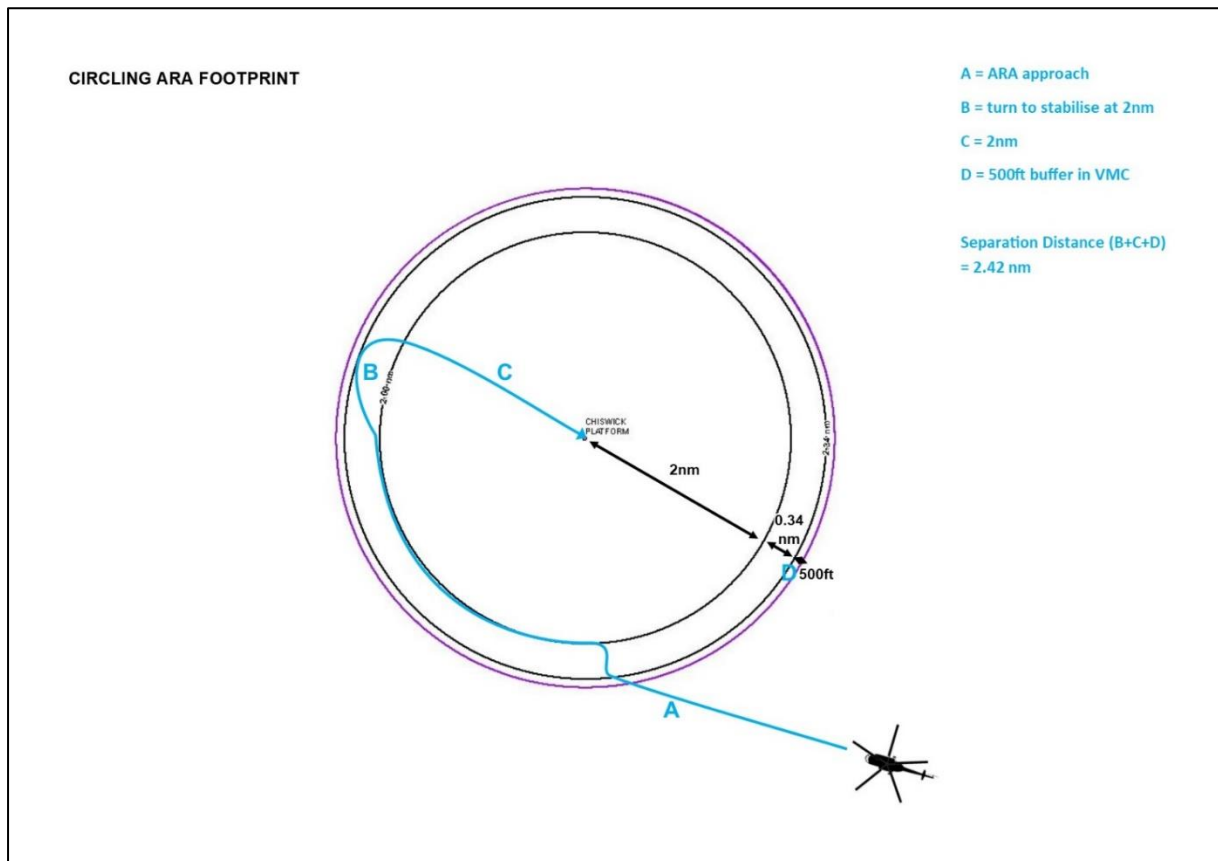


Figure 2.2: Circling ARA footprint (out of wind descent to set-up into wind on finals).

- 2.12 The footprint prepared requires a 2.42 nm radius (see Figure 2.2) and assumes that in poor visibility, as with shuttling, the visibility can be as low as 2km and so the pilot would not want to go out to 2nm as a matter of course. Once the pilot has got past the missed approach point, and has the required visual cues, they are VFR and therefore the 1 nm IMC avoidance criteria is not required as suggested by Spirit Energy, but a 500 ft (VFR) buffer is required which has been applied.
- 2.13 The Applicant noted Spirit Energy's previous concerns in regard to missed approach procedures and OEI and prepared a footprint for a missed approach and OEI in all directions. This showed that all missed approach procedures and OEI when an ARA was available could be accommodated within 1.82 nm (REF7-056).



- 2.14 The Applicant has noted Spirit Energy's concerns with regard to departures from the Chiswick and Grove platforms. The Applicant has, at the request of Spirit Energy, calculated the footprint of a departure from Chiswick Platform directly to towards Hornsea Three array with engine failure at departure from helideck and into IMC. This is shown in Figure 2.3 below.

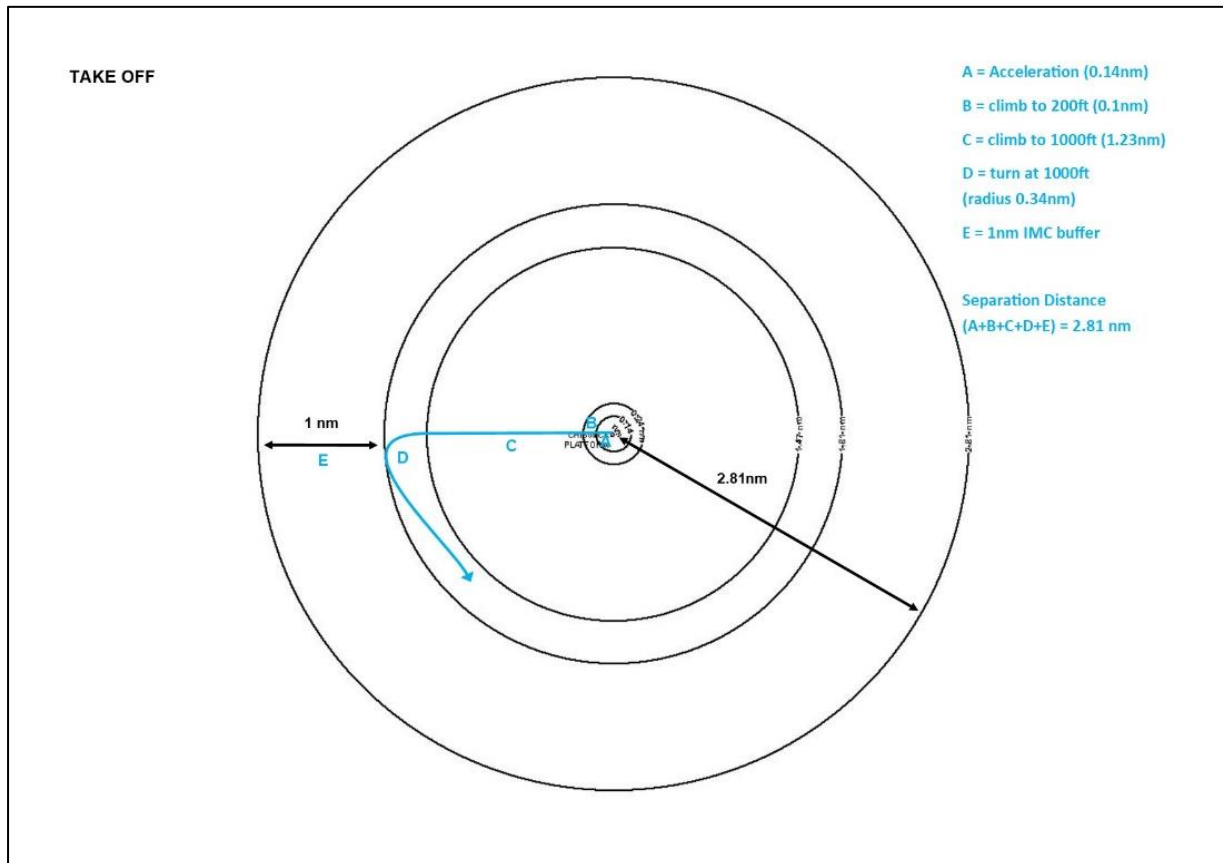


Figure 2.3: Worst case scenario take off with engine failure at take-off

- 2.15 The Applicant has calculated a required distance of 1.81 nm for the worst-case scenario with a headwind of 10 knots, taking-off at a mass of 6400 kg and an engine failure occurring on rotation from the helideck. The Applicant considers this a remote scenario (which has not occurred in the North Sea) as the helicopter operators are required to demonstrate, through a combination of engine reliability data and usage monitoring, that the probability of an engine failure during the short Exposure Time is  $<5 \times 10^{-8}$ . This worst case requires a separation distance of 1.8 nm and when including an IMC separation distance of 1nm, a total of 2.8 nm.
- 2.16 The provision of a 2.8 nm buffer at the Chiswick platform is therefore the maximum separation distance required to enable an alternative ARA flight to be flown: a circling ARA which allows for greater flexibility to the platforms, it also enables all missed approach procedures and OEI to be flown for all the conditions when an ARA is available and it enables the worst case take off with engine failure at take of to be provided.

2.17 The 2.4 nm separation distance between the Grove platform and the eastern boundary of the Hornsea Three Order limits shown on the Works Plans already enables an alternative ARA flight to be flown, namely a circling ARA, it also enables all missed approach procedures and OEI to be flown for all the conditions when an ARA is available and it enables the worst case take off with engine failure at take-off to be provided, with limited weight restrictions required if there is the potential for IMC after take-off. As such, no additional buffer is required for the Grove platform.

### **The amount of times IMC conditions require ARA**

2.18 The Applicant advises that the third main difference between the Applicant and Spirit Energy was in consideration of when ARA flights are actually required to be flown, i.e. when the IMC weather minima requires ARA and not another type of approach, and subsequently the number of days restricted by Hornsea Three.

2.19 The Applicant submitted reports to validate the assessment of ARA to Spirit Energy platforms considered in the Environmental Statement, against meteorological data from the J6A platforms (J6A data) provided by Spirit Energy at Deadline 3 (REP3-070) (Applicant's reports REP7-040 and REP9-051, with an updated version at Appendix 3 to the Applicant's response to Deadline 10).

2.20 The Applicant also analysed the IMC weather minima requiring ARA approaches using an 18 year Met Office data set for the closest Met Office monitoring station (Platform 62145 at location 53.1°N 02.8°E) in the southern North Sea (REP7-040).

2.21 The analysis has demonstrated that the IMC criteria of 5%, as used by the Applicant in Volume 5, Annex 8.1: Aviation, Military and Communication Technical Report of the Environmental Statement, is comparable to the IMC annual day average criteria derived from the Met Office data set of 3.5%.

2.22 As the respective assessments of the number of days flights were restricted by Hornsea Three using the same J6A data set by the Applicant and Spirit Energy was not in agreement, the Applicant and Spirit Energy had a consultation meeting on 13 March 2019 and a further telecom on the 20 March 2019 in order to align assumptions and methodology used in regard to the analysis.

2.23 The session was productive in that agreement was reached on the assumptions used for the purposes of the analysis. The analysis of frequency of occurrence of cloud base and visibility for types of flights available was broadly agreed. The separation distance of 2.8 nm applied, removed differences previously under discussion between the Applicant and Spirit Energy, however Spirit Energy's agreement to distance requirements for manoeuvres was caveated as being subject to validation (see paragraph 2.27).

- 2.24 The actual percentage increase in flight restrictions due to the presence of Hornsea Three is reported in a joint position statement (REP9-053) as 3.5 % by the Applicant and 5% by Spirit Energy. The Applicant considers that broad agreement has been reached between the Applicant and Spirit Energy. The remaining difference of 1.5% can be explained by the matters still not agreed as detailed in Appendix 4 to the Applicant's response to Deadline 10, but in any case, is not considered to be material, considering the quality of the J6A data set used (REP7-040).
- 2.25 The results of the re analysis of the J6A data undertaken by the Applicant have been submitted at Deadline 9 (REP7-040, with an updated version at Appendix 3 to the Applicant's response to Deadline 10) and is summarised in Table 2.1 below. For day and night combined, this shows that weather restrictions alone (the base case without Hornsea Three) preclude 8.6 % of flights. The total amount of time flights are restricted due to Hornsea Three (considering any wind direction from the east is unavailable, but not other weather restrictions) is 6.7 %. Of these restricted flights 3.2% would be restricted any way due to weather. The total increase therefore in-flight restrictions due to the presence of Hornsea Three is 3.5 %.

Table 2.1: Annual percentage flight availability Day and Night and monthly range

Scenario	Annual average day and night combined (%)	Annual average day (%)	Monthly range day (%) minimum	Monthly range (%) maximum	Annual average day (%)	Monthly range day (%) minimum	Monthly range (%) maximum
	Day and Night	Day		Night			
Total percentage of time flights are precluded due to weather restrictions (base case without Hornsea Three)	8.6%	5.1	0 (August)	28 (March)	10.5	0 (August/November)	35.4 (March)
Total percentage of time flights are precluded due to presence of Hornsea Three (without including weather restrictions).	6.7%	5.3	0 (July/August)	21.1 (April)	4	0 (August)	26.9 (May)
Total percentage of time flights are precluded due to the presence of Hornsea Three and are also precluded due to the weather restrictions	3.2%	2.6	0 (June/July/August/November)	9.9 (April)	9.7	0 (June/July/October/November/December)	12.5 (March)
<b>Increase in flight restrictions due to the presence of Hornsea Three</b>	<b>3.5%</b>	<b>2.7</b>	<b>0 (June/July/August)</b>	<b>11.2 (April)</b>	<b>5.7</b>	<b>0 (August)</b>	<b>15.8 (April)</b>

2.26 The results from the reassessment of the J6A data undertaken by the Applicant show that ARA flights to the Chiswick platform and Grove platform are restricted by the presence of Hornsea Three (at a distance of 2.8 nm from the Chiswick platform) for day for 2.7 % (or 9.9 days), which due to the coarseness of the J6A data is comparable to the value reported in Volume 5, Annex 8.1: Aviation, Military and Communication Technical Report of the Environmental Statement (APP-068; i.e. up to 3.49 days (or 1%) per year for the Chiswick platform at a distance of 1.5 nm and up to 1.31 days (or 0.4%) for the Grove platform at a distance of 2.4 nm). The values are higher, which is to be as expected as the J6A analysis is broader, in that it has considered flights are restricted for all easterly wind directions, whereas the Environmental Statement has considered the specific easterly component for each platform. The results are therefore considered to be comparable and this restriction is considered to remain a low occurrence.

**Validation by simulator trials**

2.27 Spirit Energy, whilst agreeing to the helicopter approach footprints (footprints) presented by the Applicant (REP7-056) which have enabled Spirit Energy and the Applicant to get closer on agreement on the number of days potentially restricted by Hornsea Three, have caveated their position based on the requirement for simulation trials conducted by helicopter operators to validate the approach footprints, and specifically the evaluation of pilot workload and environmental factors such as turbulence. The Applicant's position on the validation exercise is:

- The Applicant agrees with Spirit Energy that the footprints should be validated by the helicopter operators (see paragraph 2.28 below);
- The Applicant does not agree with the request for validation of pilot workload through the use of a simulator trial (see paragraph 2.29 below); and
- The Applicant does not agree with the request for validation of environmental factors such as turbulence through the use of a simulator trial, as simulators are not designed to assess turbulence (see paragraph 2.32 below).

2.28 The Applicant has sought feedback from the helicopter operators through the organisation of a meeting with CHC and a helicopter workshop and feedback has been requested on the footprints provided (REP7-056). The Applicant has responded to all the points raised by the operators as summarised in the following paragraphs. The Applicant is not aware that any more responses have been made to the footprints as suggested by Spirit Energy (REP9-077) and the deadline for receiving responses from the helicopter operators was 25 March 2019.

- In regard to take offs, two issues raised by the helicopter operators have been in regard to weight and windspeed. CHC asked for the requirement for a 7000 kg take-off weight for the AW139 to be considered but subsequently agreed that 7000 kg is not a realistic take-off mass as it does not provide out of ground effect hover performance, which would be a reduction in safety compared to the current performance available. The Applicant considers therefore that the weight used in the footprint presented by the Applicant (and agreed with by Spirit Energy in the slides presented at the ISH8 (REP-093) of 6400 kg is a realistic worst case for the Chiswick platform which is further explained in the Applicant's submission at Deadline 10 (Appendix 4 to the Applicant's response to Deadline 10 for further detail). It is important to note that even in the event a greater weight is required at take-off, this would result in a weight restriction for a certain take off direction in IMC for a limited period of time, it would not require a greater separation distance from the turbines.
- In regard to the second comment made by CHC, this was that a wind speed of 0 knots should be applied (against a head wind of 10 knots used in the calculation by the Applicant), the Applicant has explained that a wind speed of below 10 knots (and therefore of 0 knots as requested by CHC) would enable take off to be in any direction and so the take-off would not be towards the wind farm and therefore no restrictions would apply.
- In regard to the Circling ARA, the Applicant and Spirit Energy agree with the footprint available for a circling ARA of 2.42 nm but there is disagreement in regard to Spirit Energy's assertion that if there is any chance of becoming IMC, an additional 1 nm would need to be added (i.e. a footprint of 3.42 nm). The Applicant advises that during a circling approach, the helicopter will be operating visual flight rules (VFR) in order to conduct a circle and so the 1 nm instrument flight rules (IFR) avoidance criteria is not required. Feedback from the helicopter operators was sought on this footprint and the only comment was received from CHC, who noted that descents at night and in Degraded Visual Environment (DVE) will require a 2 nm set up. The Applicant considers the requirement to set up a 2 nm final from any direction, is met for a VFR approach in DVE as sufficient space is available (i.e. at 2.8 nm), even though it is probably not applicable to a circling approach. The standard ARA circling approach, with a visual reference at less than 2 nm, will remain applicable which is available as confirmed by the helicopter operators and within EASA regulations.

2.29 The Applicant does not agree that validation of the pilot workload by a simulator trial as put forward by Spirit Energy is appropriate.

2.30 The diagrams of approach distance requirements (or footprints) provided by the Applicant are based on standard regulatory requirements and the Applicant does not therefore understand the need to fly these in a simulator as they are standard profiles flown every day by the helicopter operators. They do not require any change to procedure or modifications to the operators' operations manuals.

- 2.31 For the simulator trial under discussion for Hornsea Three, it is not expected that any increase in workload will occur as the helicopter will be flown using the autopilot upper modes, as per industry guidelines. The flight profiles proposed for the trial are no different to those currently flown and so again no increase in workload should occur. Secondly, the performance model in the simulator will use the same source data as the Flight Manual performance graphs which have been used by the Applicant and Spirit Energy (submitted by the Applicant at REP7-056) to calculate the take-off distance required. Therefore, as the same source data will have been used the trial results should replicate the calculations agreed by the Applicant and Spirit Energy. If a simulator is used to test pilot workload it requires careful planning as detailed in Applicants submission at Deadline 9 (REP9-030) and a number of suitably qualified pilots employed on the trial if it is to provide meaningful results.
- 2.32 In regard to validation of environmental factors such as turbulence, the Applicant advises that this is not realistically modelled in a simulator. As the Applicant has advised (see the Applicant's position statement on Turbulence; REP7-042) what is required by the industry to verify the position of the Applicant that turbulence is not an issue, is real time measurements of turbulence on large wind farm arrays such as Hornsea Three.
- 2.33 The Applicant maintains that turbulence is not an issue, underpinned by the considerable experience of the Applicant flying in and around wind farms (see the Applicant's position statement on Turbulence; REP7-042).
- 2.34 The Applicant also notes that considering the worst case take off with engine failure at take-off and entering IMC also provides a 1 nm buffer from the turbines.
- 2.35 The Applicant therefore considers that the separation distance of 2.8 nm provided by the Applicant has resolved the issues raised by Spirit Energy in regard to the availability of flights and take offs. The remaining concerns focus around the need for validation which the Applicant considers has been provided by the helicopter operators. If further validation is sought in a simulator trial this must be conducted when sufficient time and resource is available in order that it can provide meaningful results. Regard must also be taken in the fact that the simulator will not in any case be able to be used to validate environmental factors such as turbulence.
- 2.36 The Applicant maintains that the trial, if conducted to the appropriate methodology, will confirm the footprints shared and agreed with Spirit Energy and the helicopter operators and no greater effect will arise.

**Consideration of operational effect of flight restrictions to Spirit Energy operated assets**

- 2.37 The Applicant advises that the fourth main difference between the Applicant and Spirit Energy is the consideration of the actual operational effect of the IMC restrictions to flights in certain weather conditions, considering the normal operational requirements to these assets and the restrictions imposed on them already.

- 2.38 The Applicant considers that the total percentage of time that Spirit Energy have calculated that they will be restricted by Hornsea Three of 5% is not a significant increase. The Applicant maintains that the restrictions are in regard to an operational effect and not a safety restriction for the following reasons. The Applicant notes that the assets are not considered to require 24/7/365 helicopter access as the helidecks were not certified for night operations until recently for Grove platform (the Applicant believes that similar certification for the Chiswick Platform is planned but has not yet been commissioned), and as NUIs are unmanned fail-safe platforms which can be controlled remotely, helicopters are not considered the primary means of evacuation. The Applicant advises that helicopters cannot be used when there is a hydrocarbon release or a fire, i.e. the two major types of emergency on a NUI. In the event of an injury, personnel can be rescued by SAR helicopters which operate to a greater range of weather conditions and which have appropriately trained and equipped crewmen. CAT helicopters cannot be used to transport seriously injured personnel as they do not have the trained crew or equipment.
- 2.39 The Applicant advises that helicopters are not used to show compliance with PFEER 17 at a NUI as their response time, unless based offshore, is not sufficiently quick. The standby vessel at the J6A platform will be Spirit Energy's means of showing a "good prospect of rescue" under PFEER 17 (HSE 2019). The Applicant was also advised at a consultation meeting with Spirit Energy on 1 March 2019 that in the event of a potential collision from a vessel the Chiswick and Grove platforms would evacuate to a lifeboat.
- 2.40 The Applicant is in agreement with Spirit Energy that there will be incidents on a platform which are not an emergency (Spirit Energy response to Q2.5.16 at Deadline ; REP4-012). The Applicant does not consider that there is a high potential for this to arise when personnel cannot be transferred back to the J6A platform by a shuttle flight. The Applicant has also been made aware in a consultation meeting (1 March 2019) that for instances of potential vessel collision the evacuation procedure from the Chiswick and Grove platforms is to a life boat.
- 2.41 For personnel being left on a platform this is considered a comfort issue and not one of safety as the platform must comply with HSE regulations for a safe place of refuge.
- 2.42 The Applicant is aware that planned maintenance activities will be able to proceed to the Chiswick and Grove platforms, potentially with minor adjustment to schedules to allow for any restrictions imposed by Hornsea Three. Planned activities can also proceed using alternative methods such as walk to work vessels, which are available to Spirit Energy. The Applicant notes Spirit Energy's concern in regard to unplanned maintenance and that when faults occur the platforms will not be allowed to become unsafe and instead production will be curtailed or shut-in completely until personnel can be mobilised to the platform to effect a remedy (Spirit Energy response to Q2.5.16 at Deadline 4; REP4-012). The Applicant does not consider that the frequency of unplanned visits, which are critical to the platform not being shut in, can be so high that a 5 % restriction in access has a material effect on the ability to conduct these visits.



- 2.43 In regard to the calculations presented by Spirit Energy at Deadline 9 (REP9-077) in regard to the economic cost of the restriction on Spirit Energy, the Applicant is confused and is not able to understand how Spirit Energy have calculated that a 5% restriction on flights equates to a 0.6 £million loss in revenue, as explained at in the Applicant's response to REP9-077 (presented at Appendix 4 to the Applicant's response to Deadline 10).
- 2.44 The Applicant maintains that the restrictions imposed by Hornsea Three of 3.5 % (and 5% as asserted by Spirit Energy) are on normally unmanned installations (thereby remotely accessed platforms) which experience an 8.6 % restriction in helicopter access due to weather restrictions in any case (see REP9-051, with update presented at Appendix 3 to the Applicant's response to Deadline 10)
- 2.45 The Applicant also rejects the validity of the Spirit Energy numbers presented in REP9-077 in regard to loss of revenue in regard to restricted access to existing subsea wells or indeed future aspirational wells, which are only visited for routine maintenance once every three years, as confirmed by Spirit Energy (REP9-077).
- 2.46 Regarding future activity in the Chiswick field, the Applicant has been made aware of two new well locations to the west of the Chiswick platform. The Applicant notes that Spirit Energy have submitted that access to their existing subsea wells is by vessel (paragraph 4 of Spirit Energy written submission at Deadline 3; REP3-030). In the spirit of co-existence, the Applicant has made an offer to Spirit Energy of a buffer around the proposed C6 and C7 wells of 1nm. This will enable the Applicant to be able to design the final layout with certainty and would provide Spirit Energy with access for their drilling activities via vessel and via helicopter with restricted access in certain weather conditions which is adequate for the access requirements needed to these wells (see Appendix 4 to the Applicant's response to Deadline 10 for further detail). In regard to future activity in the Grove field the Applicant was made aware during a consultation meeting in April 2018 that the Grove field could cease production by the early 2020's. The Applicant has not at any time through the examination been informed of the intent for an additional well to be drilled at Grove platform as submitted by Spirit Energy at D9 (REP9-077).

### 3. Conclusion

- 3.1 This document has set out the Applicant's final position with respect to the Aviation impacts on the Spirit Energy assets.
- 3.2 The extensive consultation between the Applicant and Spirit Energy has enabled considerable progress to be made in reaching agreement between the two parties on the technical issues arising in Spirit Energy's relevant representations submitted at Deadline 1 (RR-107, RR-108 and RR109) and has resulted in a an agreement on the percentage of time that flights to the Spirit Energy assets, the Chiswick and Grove platforms, are potentially restricted by Hornsea Three, to within 1.5%.

- 3.3 The Applicant in the spirit of co-existence, provided an offer to Spirit Energy of a 2.8 nm restricted zone around the Chiswick platform to enable a greater degree of flexibility for both approaches and take offs from the platform. The buffer has provided the maximum space required to do an approach in VMC, an en route descent, a shuttle flight from the J6A, a circling ARA, missed approach procedures with one engine inoperable (OEI) for all instances that ARA are available, and a worst case take with engine failure on take-off, and entering IMC after take-off.
- 3.4 The separation distance of the Grove platform from Hornsea Three of 2.4 nm provides for all of the above approaches and will provide a worst case take off with engine failure on take-off, with the exception of entering IMC, when a weight restriction may potentially be required for certain wind/weather criteria.
- 3.5 Spirit Energy whilst agreeing to the footprints presented by the Applicant (REP7-056) have caveated their position based on the requirement for validation by helicopter operators which has been done. The Applicant does not agree with the requirement for simulator trials to test pilot workload as no new information will be provided, but is willing to go ahead with such a trial if it is planned and conducted appropriately.
- 3.6 The Applicant does not agree with the requirement for simulator trials to test environmental factors such as turbulence as this is not achieved by a simulator;
- 3.7 The Applicants position in regard to the significance of flight restrictions on Spirit Energy operated assets has been presented. The Applicants position is that ARA flights are restricted in certain weather conditions, which have been agreed to be narrow, and that this effect is an operational effect not a safety effect. As there are alternative agreed approaches available, the effect will not be significant, on platforms which already have a degree of restricted access.
- 3.8 The Applicants position is that the Spirit Energy operated subsea wells do not require the same degree of access as to the above sea platforms and the restrictions are in any case no greater than that assessed to the Chiswick platform (not significant). The 1 nm buffer provided for by the Applicant for the C6 and C7 proposed wells will ensure there is not a significant effect on the ability to conduct planned maintenance every three years at these wells.

## Appendix A Hornsea Three consultation with Spirit Energy through Examination

Table 3.1: Hornsea Three consultation with Spirit Energy through Examination, detailing relevant examination documents and outcomes

Date	Consultation	Purpose of Meeting	Exam Deadline	Deliverables/ Requested Information	Date Deliverables received	Relevant Examination Documents	Outcome
10/10/2018	Relevant representation (Spirit Energy office)	Understand issues raised in relevant representation; Initiate Statement of Common Ground (SoCG)	1	Applicant request for information in regard to shuttle flights between J6A and NUIs	Not received	N/A	
06/11/2018	SoCG Consultation	Identify areas of agreement; Draft SoCG.	1	SoCG	Deadline 1	REP1-007	Spirit notified Applicant of exploratory wells west of Chiswick (indicative location from chart – coordinates not provided; Submission of SoCG at Deadline 1
14/11/2018	Aviation technical meeting	Discuss issues raised by Spirit at D1		Applicant request to provide height of in-field flights between J6A and Chiswick platform.	Not received	N/A	

Date	Consultation	Purpose of Meeting	Exam Deadline	Deliverables/ Requested Information	Date Deliverables received	Relevant Examination Documents	Outcome
17/12/2018	Aviation Workshop (Applicant offices)	Agree on aviation assumptions; Agree regulations; Agree available flights.	4	<p>Applicant request for:</p> <ol style="list-style-type: none"> <li>1. Provide aviation assumptions;</li> <li>2. Tabulate all regulations used;</li> <li>3. Provide aviation sections of Chiswick Safety Case;</li> </ol> <p>The Applicant to:</p> <ol style="list-style-type: none"> <li>4. provide footprints;</li> <li>5. The Applicant to provide further evidence in regard to turbulence;</li> <li>6. Table of actions;</li> <li>7. Applicant's position</li> </ol>	<ol style="list-style-type: none"> <li>1. Not received</li> <li>2. Not received</li> <li>3. Not received</li> <li>4. Provided at D7 (required agreement on dates for CHC and aviation workshop)</li> <li>5. Provided at D7</li> <li>6. D4 submission</li> <li>7. D4 submission</li> </ol>	<ol style="list-style-type: none"> <li>1. Separately, an agreement of assumptions was reached at D9 (REP9-053)</li> <li>4. REP7-056</li> <li>5. REP7-042</li> <li>6. REP4-052</li> <li>7. Applicant's response to ExA Q2.5.17 at D4 (REP4-012)</li> </ol>	<p>Applicant proposal to Spirit Energy of 1 nm buffer around exploratory wells (location geo-referenced from chart – coordinates not provided).</p>

Date	Consultation	Purpose of Meeting	Exam Deadline	Deliverables/ Requested Information	Date Deliverables received	Relevant Examination Documents	Outcome
21/02/2019	Meeting with CHC (Applicant offices)	Confirm regulations that CHC fly; Confirm current flight approaches to the Chiswick and Grove Platform; Discuss what flights available with Hornsea Three.	7	Confirmation that CHC fly to EASA and not IOGP; That en route descent, shuttle and circling ARA flights are flown routinely; That circling ARA are available at Grove.	D7	REP7-049	Meeting summary agreed by CHC; Confirmation that regulations used and available approaches put forward in ES are valid and applicable.
27/02/2019	Helicopter Operators Workshop (Applicant offices)	Confirm regulations that helicopters fly Discuss what flights available with Hornsea Three.	7	1. Confirmation that operators fly to EASA; that en route descent, shuttle and circling ARA flights are flown routinely; that circling ARA can be flown 2. Agreement that the Applicant would draw footprints for approach and take offs and provide for review.	D7	1. REP7-050 2. REP7-056	Agreement reached by both parties on the availability of flights to the Chiswick and Grove platforms.

Date	Consultation	Purpose of Meeting	Exam Deadline	Deliverables/ Requested Information	Date Deliverables received	Relevant Examination Documents	Outcome
27/02/2019	Helicopter Operators Workshop (Applicant offices)	Agreement by the Applicant to reassess data using J6A data provided by Spirit Energy	7	Validate ES Align with Spirit Energy	D7	REP3-070 REP6-008 REP7-040 REP9-051 and updated Appendix 3 to D10	Validation of the ES by the Applicant using J6A data and Met Office data
01/03/2019	REWS at Spirit Energy Offices in Amsterdam	Confirm technical and operational specifications of the REWS at J6A	7	Provide provision for mitigation if required in the Protective Provisions	D7	REP7-061 REP7-055	Agreement reached between both parties on the operational capability of the J6A REWS and required mitigation.
06/03/2019	Issue Specific Hearing 8	Present status of consultation to the ExA		Requested to provide a joint position statement on availability of flights.	D7	REP7-010 REP7-093	Agreement on footprints provided by the Applicant subject to validation. Offer of 2.8 nm buffer around Chiswick platform; At ISH8 Applicant proposes without prejudice Protective

Date	Consultation	Purpose of Meeting	Exam Deadline	Deliverables/ Requested Information	Date Deliverables received	Relevant Examination Documents	Outcome
							Provisions including a 2.8 nm restricted zone around the Chiswick Platform.
13/03/2019	J6A data analysis	Align assumptions and methodology used to inform calculations of restricted flights.	9	Agreement reached on assumptions and availability of flights. Differences remain in methodology used in analysis.	Provided at D9		Agreement reached between both parties on the assumptions used to underpin the assessments.
20/03/2019	Aviation Technical Call	Align assumptions and methodology.	9	Agreement reached on some of the methodology. Differences remaining outlined in position statement.	D9	REP9-053	Agreement reached on some of the methodology used in analysis.



Date	Consultation	Purpose of Meeting	Exam Deadline	Deliverables/ Requested Information	Date Deliverables received	Relevant Examination Documents	Outcome
25/03/2019	Validation provided by helicopter operators	Confirmation of footprints	9	Agreement provided on footprints by CHC, with three comments raised (see paragraph 2.28)	D10	Applicant's response at D10	The approaches and take offs provided by the Applicant can be flown to EASA regulations within the distances provided (footprint).