SALTHOLME GAS-FIRED GENERATING FACILITIES SHADOW HABITAT REGULATIONS ASSESSMENT ADDENDUM (V3)

Statera Energy Ltd.

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Contents

1 INTRODUCTION 1
1.1 Background 1
1.2 Revised Construction Programme 1
1.3 Revised Facility Design and Operating Hours 2
1.4 Review of Natura 2000 Sites Under Consideration for Appropriate Assessment 3
1.4.1 Zone of Influence 3
1.4.2 Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/ pRamsar Site 3
1.4.3 Elements of the Revised Development with the Potential for Likely Significant Effects 4

2 SUPPORTING ORNITHOLOGICAL DATA 5
2.1 Consultation Data 5
2.2 Field Surveys 5
2.2.1 Methods 5
2.2.2 Summary of Results 6
2.2.3 Baseline Survey Conclusions 7

3 ASSESSMENT OF IMPACTS WITH POTENTIAL FOR LIKELY SIGNIFICANT EFFECTS 8
3.1 Visual Disturbance 8
3.2 Noise Disturbance 9
3.3 Air Quality 10
3.3.1 Nutrient-N Deposition 10
3.3.2 NOx 12
3.3.3 NH_3 12
3.3.4 Acid Deposition 13

4 APPROPRIATE ASSESSMENT OF RELEVANT IMPACTS 14
4.1 Conservation Objectives 14
4.2 Assessment in Respect of the Site's Conservation Objectives 14
4.2.1 The Extent and Distribution of The Habitats of the Qualifying Features 14
4.2.2 The Structure and Function of the Habitats of the Qualifying Features 14
4.2.3 The Supporting Processes on Which the Habitats of the Qualifying Features Rely 14
4.2.4 The Population of Each of the Qualifying Features 14
4.2.5 The Distribution of the Qualifying Features Within the Site 15

5 ASSESSMENT OF IN-COMBINATION EFFECTS WITH OTHER PLANS AND PROJECTS 16

6 MONITORING AND MITIGATION 17
6.1 Monitoring 17
6.2 Mitigation 17

7 CONCLUSIONS 18

8 REFERENCES 20

Tables

Table 1: Revised Construction Programme 2
Table 2: Winter Wetland Bird Survey Details 5
Table 3: Winter Wetland Bird Survey Data (October 2018 – April 2019) 6

Figures

Figure 1: Site location plan
Figure 2: Natura 2000 sites within 1km of the development site
Figure 3: Winter wetland bird survey area
Figures 4a-4d: Winter wetland bird surveys results (waterfowl registrations)
Figures 5a-5d: Winter wetland bird surveys results (waders and other wetland bird registrations)
Figure 6: Winter wetland bird surveys flight activity
Figure 7: Construction phase noise modelling contours (CFA piling)
Figure 8: Construction phase noise modelling contours (generic activities)
Figure 9: Construction phase noise modelling contours (grid connection cable installation)
Figure 10: N Deposition Modelling Contour Map
Figure 11: NOx Modelling Contour Map

Appendices

Appendix A Details of Qualifying Interests for Teesmouth and Cleveland Coast SPA/pSPA and Ramsar Site/proposed Ramsar Site
Appendix B Summary of Original Ornithological Desk Study Data
Appendix C Sensitivity of SPA/pSPA Habitats and Species to Changes in Nutrient N Deposition and NOx Emissions

1 INTRODUCTION

1.1 Background

This report has been prepared as an addendum to the original shadow Habitat Regulations Assessment (sHRA) submitted in support of Statera Energy Ltd.'s (Statera) separate applications for two related gas-fired electricity generating facilities (GFGFs) near Saltholme, Teesside, (planning application Reference No's. 18/2079/FUL & 18/2082/FUL).

The original sHRA considered potential impacts on all Natura 2000 Sites within 15km of the combined development site ('the development site'). However, following the screening process, the assessment focussed on potential impacts on the Teesmouth and Cleveland Coast Special Protection Area (SPA) and Wetland of International Importance (Ramsar Site) and associated potential SPA (pSPA) and proposed Ramsar Site (pRamsar) extensions due to their close proximity and anticipated connectivity to the development site. This suite of existing and proposed designated sites of nature conservation interest are recognised for the important populations of breeding, migratory and overwintering wetland birds and seabirds which they support, as well as their associated overwintering wetland bird assemblage.

The original sHRA was based on the proposed construction programme which had been scheduled to conduct the majority of civil and external structural works outside of the core overwintering period (i.e. October to March, inclusive) which was deemed to be the most sensitive for birds associated with the SPA. Based on the sensitive timing of the construction works and other supporting data collected to inform the assessment it was concluded that the combined developments would not give rise to significant impacts, either individually or in combination with other plans and projects, which would adversely affect the integrity of the Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/pRamsar Site or any designated site within the Natura 2000 network. The original sHRA was submitted to and accepted by Natural England in December 2018 resulting in the developments subsequently being consented.

Since then however, Statera's construction programme has been delayed such that core external construction works will now be required to take place during the overwintering period. As such, the Royal Society for the Protection of Birds (RSPB) have asked that a revised sHRA will need to be prepared to adequately assess the potential impact of the construction works on qualifying species of the SPA/pSPA and Ramsar/pRamsar Site during the overwintering period.

In addition, Statera have revised the design of the facilities such that they are now proposing the installation of selective catalytic reduction (SCR) equipment to the four engines to reduce nitrogen oxide (NO_X) emissions as well as modifications to the building layout. Statera are also proposing to operate the facilities more frequently than was originally considered in the original sHRA.

1.2 Revised Construction Programme

The footprint of the proposed project, which includes the access road, main site compound and underground electrical connection, is slightly smaller than, but remains within, that considered in the original sHRA at approximately 5.4ha (see Figure 1).

The construction period is anticipated to last for approximately 17 months between July 2019 and November 2020. Table 1 presents a summary of the proposed construction programme. Enabling works and initial site development works (i.e. ground clearance and establishment of site compounds and infrastructure) are scheduled to take place between July and October 2019, with core external construction works taking place between October 2019 and February 2020. Thereafter, works will predominantly be located inside the constructed engine hall and involve the installation of engines, electrical works and commissioning operations.

The most notable exception to this is the installation of the grid connection cable. The two facilities will be connected to the grid at the nearby Saltholme Substation located approximately 25m to the south east with the electrical connection cable being laid underground along an excavated trench through a short section of

the Teesmouth and Cleveland Coast pSPA. Consequently, these works are programmed to take place in April 2020 in order to avoid the more sensitive overwintering period when birds associated with the pSPA are expected to be absent or at least much less abundant such that any disturbance impacts are anticipated to be negligible.

Preparatory works for the construction of the engine halls (x4) and substation will require piling. This will be undertaken by continuous flight auger (CFA) bored piling which has been selected as it is less intrusive, and hence quieter, than the alternative driven piling. These works will be undertaken between October and December 2019 which is acknowledged to be within the core overwintering period; the impacts of which are assessed in Section 3 of this addendum.

Table 1: Revised Construction Programme

Construction Task	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20
Enabling works (incl. ground clearance and establishment of construction compound)	■	■	■														
Site facilities construction (drainage, road access, fencing, etc.)	■	■	■	■													
Sub-station construction				■	■	■											
Switch house construction				■	■	■											
Engine hall construction				■	■	■	■	■									
Engine delivery and installation								■	■								
Connection to grid									■	■							
Cable installation										■							
Internal works (electrics and commissioning etc.)										■	■	■	■	■	■	■	
Removal of site compound and demobilisation																■	■
Completion and handover to operation																	■

Construction will involve a workforce of up to 20 personnel, although this may peak initially at up to 40 personnel during the early ground works phases. It is proposed that a temporary construction compound is established to the south of the existing track, between the main site compound and the turnoff from the A1185 (see Figure 1). This compound will contain site welfare, temporary offices, skips, car parking and set down areas.

The maximum number of outwards movements of construction vehicles in any one day will be approximately 10 HGVs. However, this is the peak and will probably be confined to the early earthworks / civils phase of the project (i.e. July to October 2019).

1.3 Revised Facility Design and Operating Hours

Other than some minor layout modifications, the operational project remains largely consistent with that considered in the original sHRA with the exception of the proposed installation of selective catalytic reduction (SCR) equipment to the engines reduce nitrogen oxide (NO_X) emissions. This will however, result in the increased emission of ammonia which could affect air quality. As such, addendums to the original air quality report have been prepared (RPS, 2019a and 2019b).

Statera are also proposing to operate the facilities for a greater total annual time period than was considered in the original sHRA. The proposed project would operate at times of peak electricity demand and would not operate for a total annual time period greater than 3,500 hours. For the remainder of the time, the proposed project would be switched off, awaiting instruction to power up in response to market conditions and or

National Grid. On average, it is predicted that this would occur on weekdays and involve periods of operation ranging from 30mins to eight hours, between 07:00 and 20:00. Outside these hours, an event such as a major power shortage or system stress event may result in the proposed project stepping in to provide generating support. Whilst the probability of the proposed project being required to start during the night is low, this has been considered along with the more normal times of operation identified above.

1.4 Review of Natura 2000 Sites Under Consideration for Appropriate Assessment

1.4.1 Zone of Influence

As detailed in the original sHRA, disturbance effects from construction were predicted to extend to no more than 1km from the proposed development and this is still considered to be the case. Therefore, only European Sites within this distance are considered in this report in relation to the potential impacts during the construction phase.

The only Natura Site within this distance from the proposed development site is Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/pRamsar Site. The location of these sites in relation to the development site is shown in Figure 2.

For the operational phase, the original air quality report (RPS, 2018) and sHRA considered all European sites within 15km in accordance with the guidance of DEFRA and EA (2016) and Natural England's original Scoping Response (as detailed in the original sHRA). The following Natura 2000 sites were identified;

- Teesmouth and Cleveland Coast SPA and Ramsar Site;
- Teesmouth and Cleveland Coast proposed SPA and Ramsar Site;
- Northumbria Coast SPA and Ramsar Site;
- Durham Coast SAC; and,
- North York Moors SPA and SAC.

Based on the findings presented in the addendums to the air quality report, it is considered that only Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/proposed Ramsar Site have the potential to be affected by air quality and pollution effects as a result of the operation of the facilities and so significant effects cannot be ruled out. All others are located sufficiently far away to receive significant concentrations of airborne contaminants (i.e. over 13km). Consequently, the other sites are all excluded from further assessment.

1.4.2 Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/ pRamsar Site

The existing Teesmouth and Cleveland Coast SPA and Ramsar Site is of European importance because it supports important breeding populations of breeding little tern, migratory Sandwich tern and redshank and overwintering red knot. Three further species are proposed to be added under the pSPA/pRamsar Site: breeding avocet and common tern and overwintering ruff. The full list of existing and proposed qualifying species is identified in Appendix A.

Both the existing and proposed sites are also designated for supporting a waterbird assemblage of at least 20,000 individuals during the non-breeding season, although the main component species identified under the existing and proposed designations are different, details of which are also presented in Appendix A.

1.4.3 Elements of the Revised Development with the Potential for Likely Significant Effects

During the construction and operation of the development there are five impact pathways which could potentially affect Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/pRamsar Site, either through effects on habitats, or associated qualifying species. These are:

- Habitat deterioration through ground or water pollution;
- Habitat deterioration through air pollution;
- Direct land take;
- Auditory/noise disturbance; and
- Visual disturbance.

Of these, the nature and extent of direct land take and habitat deterioration will be the same, if not less, than that considered in the original sHRA and as such they are not reassessed in this addendum. Only the impacts of noise and visual disturbance have the potential to change due to the revised construction programme. This is due to the scheduling of civil and external construction works within the core overwintering bird period when the presence and abundance of wetland birds associated with the SPA/pSPA and Ramsar/pRamsar Site in proximity to the development site are expected to be higher. During the operational phase only the potential for habitat deterioration to occur as a result of air emissions is likely to change.

2 SUPPORTING ORNITHOLOGICAL DATA

2.1 Consultation Data

Consultation data from various sources was obtained and presented in support of the original sHRA. A summary of this data is re-presented in Appendix B.

2.2 Field Surveys

In addition to the above, a programme of winter wetland bird surveys was conducted to inform the original sHRA. Due to the projects' original timescales, only data collected between October and December 2018 were presented in the original sHRA, upon which the development was subsequently consented as sufficient evidence existed to confirm no adverse effects on site integrity. However, surveys continued monthly between January and April 2019 at the request of RSPB in order to collect a full winter's worth of survey data for the site.

2.2.1 Methods

The winter wetland bird surveys were conducted at least once per month between October 2018 and April 2019 by suitably experienced field ornithologists, with higher frequency of effort between mid-November and mid-December 2018 in order to increase the volume of data upon which to base the original sHRA. The aim of the surveys was to identify usage of the fields within and immediately surrounding the development site by waterfowl and wading birds, particularly SPA/pSPA and Ramsar/pRamsar Site qualifying species. The surveys covered the fields of the development site and all areas of suitable habitat within a surrounding buffer of 500m (see Figure 3). This included the fields to the north, east and west of the site as well as the pools and surrounding rough grassland habitat associated with the north western corner of RSPBs Saltholme Reserve and hence the SPA/pSPA and Ramsar/pRamsar Site.

Surveys were timed to cover all parts of the diurnal period including late afternoon and dusk as requested by RPSB. In addition, two early evening (nocturnal) surveys were conducted on 06 and 07 December 2018 in an attempt to demonstrate any night time field use. Details of all surveys including their timing relative to sunset are presented in Table 2.

Table 2: Winter Wetland Bird Survey Details

Date	Start Time	End Time
31/10/18	11:30	15:00
20/11/18	08:00	12:00
27/11/18 (1)	09:45	12:45
27/11/18 (2)	13:15	16:15
04/12/18 (1)	08:30	11:30
04/12/18 (2)	12:30	15:30
06/12/18 (1)	10:00	13:00
06/12/18 (2)	14:00	17:00
07/12/18	14:00	17:00
08/12/18	09:30	12:30
22/01/19	12:30	16:00
19/02/18	13:30	17:00
12/03/18	08:45	12:15
09/04/18	06:15	11:15

2.2.2 Summary of Results

Table 3 presents the peak counts of all waterfowl and wading bird species recorded during the surveys. The distribution of the various species in each survey is presented in Figures 4a-d (waterfowl) and Figure 5a-d (waders and other wetland birds).

Table 3: Winter Wetland Bird Survey Data (October 2018 – April 2019)

Species	31/10/18	20/11/18	27/11/18 (1)	27/11/18 (2)	04/12/18 (1)	04/12/18 (2)	06/12/18 (1)	06/12/18 (2)	07/12/18	08/12/18	22/01/19	19/02/19	13/03/19	09/04/19
Black-headed gull	37	12	2	-	48	-	-	-	-	-	12	-	28	16
Canada goose	346	738	948	560	685	860	760	680	790	690	1082	713	189	38
Common Gull	-	-	-	-	-	-	-	-	-	-	96	-	-	-
Coot	107	143	-	-	115	115	193	215	138	227	75	85	38	62
Cormorant	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Curlew	35	38	34	2	64	58	-	-	1	5	55	11	63	40
Little egret	1	-	-	-	-	-	-	-	-	-	-	3	-	1
Gadwall	34	4	-	-	-	-	-	-	2	2	-	8	2	-
Great. black-backed gull						1	-	-	-	-	-	-	-	-
Greylag goose	44	101	138	138	135	185	370	20	-	40	28	-	12	7
Grey heron	2	1	1	-	-	1	-	-	1	-	-	-	-	-
Herring gull	-	23	3	-	4	6	-	-	-	-	-	-	-	12
Lapwing	-	-	23	-	22	-	-	-	-	-	-	-	2	4
Little grebe	1	-	-	-	-	-	-	-	-	-	-	-	2	-
Mallard	5	38	2	2	12	2	10	4	17	5	-	-	6	1
Moorhen	1	-	-	-	-	-	2	-	-	-	1	-	-	-
Mute swan	-	2	-	-	-	2	-	2	-	-	-	-	2	-
Oystercatcher	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Pink-footed goose	-	-	13	13	12	12	-	50	70	50	-	-	-	-
Pochard	-	-	-	-	-	-	-	-	-	-	2	7	-	-
Redshank	1	1	2	2	4	2	6	-	-	-	2	-	-	-
Snipe	2	-	-	-	-	-	-	-	1	-	-	-	-	-
Shelduck	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Shoveler	3	-	-	-	-	-		-	-	-	-	4	-	5
Teal	5	8	-	185	48	36	-	-	10	-	-	65	22	-
Tufted duck	2	6	-	-	6	-	-	6	9	4	-	4	3	22
Hybrid goose	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Wigeon	5	68	350	95	48	365	200	250	250	20	95	297	45	-
Whooper swan	-	-	-	-	-	-	1	-	-	-	-	-	-	-

From the field survey data redshank was the only qualifying species of the SPA/pSPA and Ramsar/pRamsar Site recorded, and even then, only in very low numbers with a peak of six individuals. These birds were typically recorded on the small wetland pools of the pSPA and pRamsar Site immediately to the south of the proposed development.

The most abundant and frequently occurring species recorded over the survey period were feral/naturalised Canada geese and greylag geese (i.e. non-SPA birds), along with wigeon and coot, while smaller numbers of mallard, teal and tufted duck also occurred regularly. While the geese were found in both the Saltholme

reserve and on the fields within and immediately surrounding the proposed development site, the various duck species were almost entirely restricted to the pools within the Saltholme reserve. Small flocks of up to 70 pink-footed geese were also recorded using the fields within and immediately surrounding the proposed development site.

Curlew were the most regularly recorded species of wading bird and although numbers were variable, they typically ranged between the mid-30's to mid-60's. Birds were typically found both within the grassland areas of the Saltholme reserve and in association with the wetland pools of the pSPA to the southwest of the proposed development site.

Lapwing were also recorded but only occasionally and in relatively low numbers of no more than 23 birds, with only one record of 2 birds being recorded in the fields of the development site itself.

All other species were typically recorded infrequently and in relatively low abundance.

In addition to the identification of the main areas and habitats used by wetland bird species of the SPA/pSPA above, flight activity was also recorded during the surveys. Figure 6 presents all wetland bird flights recorded during the survey period. This shows that the frequency of flights over the development site is low with the majority of flights within the wider survey area being of curlew, lapwing, mallard and greylag geese between the Saltholme reserve and the pools or fields to the south and west of the site or beyond.

2.2.3 Baseline Survey Conclusions

The results of the winter wetland bird surveys demonstrate that the fields within and immediately surrounding the proposed development site support negligible diversity or abundance of SPA/pSPA qualifying species. They do nonetheless occasionally support small to moderate-sized flocks of both pink-footed geese and waders (mainly curlew but also some lapwing) as well as large numbers of naturalised/feral (non-SPA) Canada and greylag geese. The majority of wetland birds observed throughout the winter survey programme were almost entirely found on the pools within the Saltholme Reserve.

3 ASSESSMENT OF IMPACTS WITH POTENTIAL FOR LIKELY SIGNIFICANT EFFECTS

3.1 Visual Disturbance

Reviews of visual disturbance to birds provide a range of distances at which different species are likely to be susceptible to visual disturbance stimuli (i.e. personnel, operating machinery, artificial lighting etc). Cutts et al. (2013) suggests that approximately 300m is the distance at which more disturbance-sensitive species such as curlew may respond to visual stimuli.

The potential impacts of visual disturbance on SPA/pSPA and Ramsar/pRamsar Site qualifying species which occur during the breeding and post-breeding season (i.e. little tern, common tern and avocet and post-breeding Sandwich terns), was discussed in the original sHRA. This identified that none of the above species were known to breed within at least 900m from the development site; the closest being common tern in the central part of the adjacent Saltholme Reserve.

With regards to SPA/pSPA and Ramsar/pRamsar Site qualifying species which occur during the non-breeding season (i.e. redshank, knot and ruff), field survey data (presented in Section 2) identify that redshank was the only such species to be recorded within 500m of the development site and that it was only present in very low abundance. In term of the overwintering waterbird assemblage the field survey data identified that with the exception of naturalised/feral (i.e. non-SPA) Canada and greylag geese, the majority of wetland birds observed throughout the winter survey programme were almost entirely found on the pools and associated grassland areas within the Saltholme Reserve. These areas are located approximately 200m from the nearest part of the development site (i.e. the grid connection cable route) and 300m from the main development site (i.e. where the engine hall and substation will be).

The habitats within approximately 300m of the main development site (i.e. fields within and immediately surrounding the development site and the adjacent Pipeline Pools) typically only supported occasional small numbers of waterfowl and wading birds throughout the winter. This is notable because the Pipeline Pools form part of the pSPA and pRamsar Site. This is generally supported by the available desk study data (Appendix B). Perhaps the only slight exception to this was the occurrence of moderate-sized flocks of curlew at the western end of the Pipeline Pools, and hence within the pSPA and pRamsar Site. However, the location where these birds would congregate is still over 300m from the development site and such occurrences were only observed occasionally. What is more, similarly sized flocks of curlew were as frequently recorded in the grassland areas surrounding the pools within the Saltholme Reserve suggesting that the birds were not solely dependent on the area at the western end of the Pipeline Pools.

Therefore, the majority of the construction works (i.e. all but the installation of the grid connection cable), will be over 300m from the main areas which are typically occupied by birds associated with the SPA/pSPA and Ramsar/pRamsar Site and hence beyond the distance within which birds are expected to be disturbed by visual stimuli.

The grid connection cable installation works will occur within the pSPA and pRamsar Site and within 300m of the areas of the Saltholme Reserve which are regularly occupied by large number of birds associated with the SPA/pSPA and Ramsar/pRamsar Site. However, the Saltholme Reserve pools are positioned at a slightly lower topographical level than the cable route and also surrounded by a reedbed. Consequently, the grid connection cable installation works which will predominantly occur at ground level will almost certainly not be visible to birds on or immediately surrounding the Saltholme Reserve pools. Furthermore, the grid connection cable installation works are also expected to be largely obscured by the presence of the gas pipeline which segregates it from the Saltholme Reserve. These barriers to potential visual disturbance sources within the development site will also be applicable to obscuration of activities within the wider development site.

For activities taking place above ground level, the 300m segregation distance is expected to be sufficient that wetland birds within the Saltholme Reserve will be largely undeterred by the presence of human

activities, particularly given the existing human activities and industrial nature of the surrounding area. In relation to this, it is important to acknowledge that it is typically the presence of humans rather than operating machinery that cause disturbance to birds (Cutts et al., 2013) and that the nearby pools of Saltholme Reserve are regularly visited and circumnavigated by visitors in full view of the birds at much closer distances than those relating to the construction works, with apparently acceptable disturbance effects.

Even if some birds were to be disturbed by any of the above works, it is expected that such effects would be temporary (i.e. at the outset of disturbing activities) and there is an abundance of suitable alternative habitat in the nearby surrounding area to which birds may be displaced. It is also anticipated that birds will likely become habituated to the visual disturbance associated with construction activities, such that any displaced birds will to return within a relatively short period of time.

Based on the above, it is considered that there is negligible potential for any significant effects on SPA/pSPA qualifying species from visual disturbance during construction.

3.2 Noise Disturbance

A revised assessment of the potential impacts of noise generated during the construction phase of the development has been undertaken. This specifically takes account of the following key construction activities/noise sources; CFA piling and general site construction activities from within the main site compound and groundworks along the grid connection cable route.

Reviews of noise disturbance to birds provide a range of sound levels at which disturbance to birds could occur. Cutts et al. (2013) suggest that whilst a noise level of 55dBA at the bird is considered unlikely to cause disturbance to birds, a noise level of 60-72dBA at the bird could represent either high or moderate disturbance depending on the context (e.g. habituation of birds, ambient noise levels). 55dB is therefore considered to represent an accepted threshold below which noise disturbance effects are predicted to be acceptable.

Figure 7 presents the results of the CFA piling noise modelling assessment, which taken from the centre of the main development site and is expected to be the loudest noise generated during construction. This shows that the loudest generic construction activities would give rise to noise levels of approximately 80dB ‘at source’. This would decline to less than 55dB at the nearest point of the Teesmouth and Cleveland Coast pSPA and pRamsar Site (i.e. within approximately 110m to the south of the main development site) and less than 45dB at the nearest point of the existing Teesmouth and Cleveland Coast SPA and Ramsar Site (i.e. within approximately 340m to the south of the location of the main development site). Beyond that, noise levels would decline progressively further from the proposed project so that by approximately 500m from the main development site noise levels would be reduced to no more than approximately 40dB and at 1km away would be down to less than 35dB.

Figure 8 presents the results of the noise modelling assessment for generic construction activities which is also taken from the centre of the main development site. This shows that the loudest noise generated during generic construction activities would give rise to noise levels of between 70db and 75dB ‘at source’. This would decline to no more than 45dB at the nearest point of the Teesmouth and Cleveland Coast pSPA and pRamsar Site and no more that 35dB at the nearest point of the existing Teesmouth and Cleveland Coast SPA and Ramsar Site.

Figure 9 presents the results of the noise modelling assessment for construction activities associated with the installation of the grid connection cable. This is taken from two locations, one at the centre of the cable route to represent trenching and cable installation works and the other just within the main development site to represent stockpiling of excavated spoil. This shows that the loudest noise generated during the cable installation works, which would take place within the Teesmouth and Cleveland Coast pSPA and pRamsar Site, would give rise to noise levels of between 75dB and 80dB ‘at source’. However, this would rapidly decline to less than 40dB at the nearest point of the existing Teesmouth and Cleveland Coast SPA and Ramsar Site.

Based on the above, the potential impacts of noise disturbance on SPA/pSPA and Ramsar/pRamsar Site qualifying species which occur during the breeding and post-breeding season (i.e. little tern, common tern and avocet and post-breeding Sandwich terns) are expected to be negligible since none of these species are known to breed within at least 900m from the development site as detailed above and in the original sHRA. Indeed, none of these species are expected to occur in the immediate vicinity of the development site based on the available desk study data and low suitability of the habitat for them.

With regards to SPA/pSPA and Ramsar/pRamsar Site qualifying species which occur during the non-breeding season and the CFA piling and generic construction activities specifically, the noise levels associated with these activities are expected to be no more than the acceptable 55dB noise threshold within both the SPA/pSPA and Ramsar/pRamsar Site. Furthermore, the field survey data (presented in Section 2) identifies that with the exception of naturalised/feral (i.e. non-SPA) Canada and greylag geese, the habitats immediately surrounding the development site are of negligible importance to wetland birds associated with the designated sites. Consequently, the effects of noise disturbance from these activities on wetland birds during the overwintering period are predicted to be negligible.

With regards to noise disturbance generated during the installation of the grid connection cable works which would take place within the Teesmouth and Cleveland Coast pSPA and pRamsar Site, the peak 'at source' noise levels of between 75db and 80dB would be above the acceptable 55dB threshold for the most noise-sensitive wetland birds. However, as detailed above, the field survey and desk study data identify that with the exception of naturalised/feral (i.e. non-SPA) Canada and greylag geese, the majority of wetland birds observed throughout the winter months are almost entirely found on the pools and associated grassland areas within the Saltholme Reserve. These areas are located over 130m from the grid connection cable route where noise levels are predicted to be dissipated to less than 45dB and more typically between 30dB and 40dB. This is also the case for the grassland area at the western end of the Pipeline Pools where moderate-sized flocks of curlew were occasionally recorded during the winter wetland bird surveys. Consequently, noise levels within the core areas where the majority of wetland birds occur in the vicinity of the development site, and more specifically the grid connection cable corridor, will be well within the acceptable 55dB wetland bird disturbance noise threshold.

Even if some birds were to be disturbed by any of the above works, it is expected that such effects would be temporary (i.e. at the outset of disturbing activities) and there is an abundance of suitable alternative habitat in the nearby surrounding area to which birds may be displaced. It is also anticipated that birds will likely become habituated to the relatively low level ambient noise generated by construction activities, such that any displaced birds will return within a relatively short period of time.

Based on the above, it is considered that there is low potential for any significant effects on SPA/pSPA qualifying species from noise disturbance during construction.

3.3 Air Quality

The original sHRA presents an overview of the air quality assessment while the full methodology for assessing the impacts on air quality as well as the full results are presented in the air quality assessment addendum reports (RPS, 2019a and 2019b). A summary of the results is presented below in order to inform the Appropriate Assessment of effects in relation to Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/proposed Ramsar Site. The main difference to this compared to the original sHRA is the inclusion of ammonia (NH_3) which is released as part of the SCR NOx reducing process and contributes to the overall emission of nutrient nitrogen (N).

3.3.1 Nutrient-N Deposition

This accounts for the combined contributions from NOx and NH_3. The maximum Process Contribution (PC) N deposition levels for the Teesmouth and Cleveland Coast SPA and Ramsar Site, and for Teesmouth and Cleveland Coast pSPA and proposed Ramsar Site from the proposed project on its own are calculated as being up to 4% and 10% of the lower range Critical Loads respectively, and are therefore, considered to be significant for both sites. When analysing this further, the Predicted Environmental Concentrations (PECs)

for nutrient-N deposition are 50% and 56% above the lower range of the Critical Load threshold for the two sites respectively (8 kgN.ha-1.yr-1) and are therefore significant in the context of N deposition levels for the local receiving environment.

In arriving at this outcome, it is worth noting that the ambient/baseline nutrient-N deposition level for the area (11.7 kgN.ha-1.yr-1) is already recognized to exceed the lower range of the Critical Load threshold for both sites by 46%.

Tables 12 and 13 of the original sHRA detailed the effects that excess N-deposition is likely to have on the habitats and qualifying species associated with the SPA/pSPA and whether these are likely to have negative, or positive impacts, as taken from the UK Air Pollution Information System (APIS) database (http://www.apis.ac.uk/). These tables are re-presented for the purposes of this addendum in Appendix C, Tables C1 and C2.

From the information presented in these tables, the species which could potentially be adversely affected by N deposition are those which are associated with sand dune habitats (e.g. little tern, Sandwich tern and common tern) and breeding avocet associated with saltmarsh.

Most, if not all other species associated with the SPA/pSPA are unlikely to be significantly affected by N-deposition, either because the habitats upon which they depend are not expected to be affected, despite being potentially susceptible to N inputs, or because the species themselves are not susceptible to causative habitat changes.

Contour mapping depicting the depreciation of N-deposition concentrations with increased distance from the proposed development (presented in the air quality assessment addendum reports (RPS, 2019a and 2019b) and re-presented in Figure 10), shows that concentrations fall below 1% of the Critical Load between approximately 900m and 3.75km of the proposed development. Consequently, for little tern, whose core habitats are located 13.8km from the proposed development (as detailed in Section 5 of the original sHRA and summarised in Appendix A), concentrations of N-deposition in the coastal habitats which they use will be negligible and insignificant. Therefore, adverse effects on the habitats used by this species, and hence the species itself can be ruled out.

By comparison, common tern and avocet breed on saltmarsh and sparsely vegetated or short-growing margins (as well as artificial rafts in the case of common terns) predominantly associated with freshwater and/or brackish pools at RSPB's Saltholme Reserve and the wider North Tees Marshes. Such areas fall within 2km from the proposed project (as detailed in Section 5 of the original sHRA and summarised in Appendix A). (For common terns this is contrary to the typical coastal dune habitats attributed to them in the APIS database). The N-deposition contour mapping in Figure 10 shows that deposition levels across much of RSPB's Saltholme Reserve and the North Tees Marshes, including areas where avocet and common tern are known to breed, are predicted to be over the 1% Critical Load threshold. Consequently, there is potential for the habitats in these areas to be adversely affected by N-deposition. However, for saltmarsh areas, which are typically subject to daily, periodic flooding with saline water, airborne N-deposition is of low importance as the inputs will be significantly below the large nutrient loadings from river and tidal inputs (APIS database). Furthermore, the effects of N-deposition are more likely to be associated with taller vegetation of upper marsh communities where interspecific competition and the influence of nutrient enriched runoff is greatest (APIS database). As such, the low and mid-saltmarsh habitats most likely to be used by avocet are not expected to be significantly affected by airborne N-deposition compared to other sources. Furthermore, for common terns in particular, the N-deposition contribution from airborne emissions is expected to be negligible compared to the inputs from ammonia resulting from the guano deposited within their densely populated nesting colonies during the breeding season. The predicted N-deposition contribution from the proposed development will also be infinitesimal compared to the nutrient levels in the freshwater and coastal habitats in which they typically forage. Overall therefore, it is considered that adverse effects on the SPA/pSPA habitats used by avocet and common tern, and hence the species themselves can be ruled out.

Finally, Sandwich terns are known to use coastal habitats approximately 2.8km from the proposed development (as detailed in Section 5 of the original sHRA and summarised in Appendix A) and hence includes areas where N-deposition levels are also predicted to be over the 1% Critical Load threshold.

However, this species is only designated during the post-breeding, passage period when birds are either foraging over open coastal waters or roosting on coastal habitats such as sandy and rocky foreshores or exposed sandbars and outcrops. These, typically unvegetated roosting habitats will not therefore be affected by N-deposition, while the nutrient levels in the coastal waters in which they feed are predicted to be immensely greater than that contributed by the proposed development, as detailed above. As such, it is considered that adverse effects on the SPA/pSPA habitats used by Sandwich tern, and hence the species itself can also be ruled out.

3.3.2 NOx

The short-term and long-term PCs for NOx were calculated as being at or above the respective 10% and 1% Critical Level thresholds for the Teesmouth and Cleveland Coast SPA and Ramsar Site (20% and 1% respectively), and for Teesmouth and Cleveland Coast pSPA and proposed Ramsar Site (58% and 3% respectively). Indeed, the short-term PC took the overall PEC for the Teesmouth and Cleveland Coast pSPA and proposed Ramsar Site over the Critical Level threshold for NOx by 27%, although in the long term the annual PEC is predicted to remain below the Critical Level.

Tables 14 and 15 of the original sHRA detailed the effects that excess NOx deposition is likely to have on the habitats and qualifying species associated with the SPA/pSPA and whether these are likely to have negative, or positive impacts, as taken from the UK Air Pollution Information System (APIS) database (http://www.apis.ac.uk/). These tables are also re-presented for the purposes of this addendum in Appendix C, Tables C1 and C2.

From the information presented in these tables, the species which could potentially be adversely affected by NOx emissions above the Critical Level are those which are associated with sand dune habitats (e.g. little tern, Sandwich tern and common tern). While all of the habitats upon which qualifying species of the Teesmouth and Cleveland Coast SPA/pSPA depend are potentially susceptible to the effects of NOx emissions those effects are typically restricted to close proximity (i.e. within 1km) to major roads/motorways and combustion sources. However, the effects of NOx on these habitats is limited to changes in the species composition of the associated plant communities which are unlikely to be significantly affected due to other more substantial influences.

Contour mapping in the air quality assessment addendum reports (RPS, 2019a and 2019b) and re-presented in Figure 11, shows that NOx concentrations fall below 10% of the Critical Level between approximately 925m and 1.25km of the proposed development. Therefore, NOx concentrations will be negligible and insignificant for the coastal habitats used by little tern and Sandwich tern, whose core habitats are located 13.8 and 2.8km from the proposed development respectively (as detailed in Section 5 of the original sHRA and summarised in Appendix A). Therefore, adverse effects on the habitats used by these species, and hence the species themselves can be ruled out.

Meanwhile, the freshwater and/or brackish pools at RSPB's Saltholme Reserve and the wider North Tees Marshes, at which most of the pSPAs avocet and common terns breed, are predominantly over 900m from the proposed project (as detailed in Section 5 of the original sHRA and summarised in Appendix A). Consequently, the vast majority of areas used by these species are predicted to be below 10% of the Critical Load threshold and hence not significant. Furthermore, the APIS database identifies that the coastal, freshwater and terrestrial habitats which these birds are most likely to use are subject to much greater N inputs from terrestrial sources than airborne contributions. In addition, and as noted above in relation to nutrient N-deposition, inputs from the guano deposited within the densely populated common tern nesting colonies during the breeding season are also expected to outweigh airborne contributions. Consequently, adverse effects on the habitats used by avocet and common tern within the pSPA, and hence the species itself can also be ruled out.

3.3.3 NH3

The NH_3 PCs were calculated as being above the 1% Critical Level thresholds for both the Teesmouth and Cleveland Coast SPA and Ramsar Site and pSPA and proposed Ramsar Site (2% and 5% respectively).

When analysing this further however, the PCs represent negligible increases on the baseline/ambient concentrations while the overall PECs are less than 50% of the lower range Critical Level threshold for the two sites. As such, air quality impacts from increased NH_3 on the receiving environment from the proposed project on its own are not significant and can be screened out of further assessment.

3.3.4 Acid Deposition

The acid deposition PCs were calculated as being at or above the 1% Critical Level thresholds for both the Teesmouth and Cleveland Coast SPA and Ramsar Site and pSPA and proposed Ramsar Site (1% and 3% respectively). When analysing this further however, the PCs represent negligible increases on the baseline/ambient concentrations while the overall PECs are less than 50% of the lower range Critical Load threshold for the two sites (1.998 keq.ha-1.yr-1). As such, air quality impacts from increased acid deposition on the receiving environment from the proposed project on its own are not significant and can be screened out of further assessment.

4 APPROPRIATE ASSESSMENT OF RELEVANT IMPACTS

4.1 Conservation Objectives

The conservation objectives for the Teesmouth and Cleveland Coast SPA and pSPA have been developed to ensure that the integrity of the sites is maintained or restored as appropriate, and ensure that the sites contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- the extent and distribution of the habitats of the qualifying features;
- the structure and function of the habitats of the qualifying features;
- the supporting processes on which the habitats of the qualifying features rely;
- the population of each of the qualifying features; and
- the distribution of the qualifying features within the site.

4.2 Assessment in Respect of the Site's Conservation Objectives

4.2.1 The Extent and Distribution of The Habitats of the Qualifying Features

As the footprint of the developments and the nature and extent of the works will be similar, if not less than that which was considered in the original sHRA the assessment and conclusions relating to potential impacts on the extent and distribution of the qualifying features will be no different to those presented in the original sHRA. Consequently, this is not reassessed here.

4.2.2 The Structure and Function of the Habitats of the Qualifying Features

The footprint of the developments and the nature and extent of the works will be similar to, if not less than that which was considered in the original sHRA. Meanwhile, the potential effects associated with revised air quality impacts are not considered to alter the structure or function of the habitats of the qualifying features associated with the Teesmouth and Cleveland Coast SPA/pSPA (or Ramsar/proposed Ramsar Site) during the operation of the proposed development. Consequently, the assessment and conclusions relating to potential impacts on the structure and function of habitat of the qualifying features are not expected to be any different to those presented in the original sHRA. Consequently, this is not reassessed here.

4.2.3 The Supporting Processes on Which the Habitats of the Qualifying Features Rely

As the footprint of the developments and the nature and extent of the works will be similar, if not less than that which was considered in the original sHRA the assessment and conclusions relating to potential impacts on the supporting processes on which the habitats of the qualifying features rely will be no different to those presented in the original sHRA. Consequently, this is not reassessed here.

4.2.4 The Population of Each of the Qualifying Features

Whilst small changes in the distribution of some species associated with the Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/pRamsar Site is possible as a result of visual and/or noise disturbance during the construction phase, these effects will be temporary and highly localised and are not predicted to result in the mortality of any qualifying species.

Based on the available data and the nature and limited extent of habitat which may be affected by construction phase disturbance, it is predicted that this will only affect small, insignificant numbers of birds. Moreover, there is considered to be an abundance of suitable alternative habitat in the nearby surrounding area to support any which birds may be temporarily displaced. As only small numbers of birds are anticipated to be temporarily affected this is not expected to result in increased competition between birds in the areas to which birds are displaced. As such, this conservation objective would be maintained.

4.2.5 The Distribution of the Qualifying Features Within the Site

While small changes in the distribution of some species associated with the Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/pRamsar Site is possible as a result of visual and/or noise disturbance, any effects are expected to be negligible and temporary. At worst, this might cause the short-term displacement of any qualifying species which may occur in the immediate vicinity of the proposed project. Based on the available data and the nature and small area of habitat which may be affected, it is predicted that this will only affect small, insignificant numbers of birds.

Even if this were to occur, there is considered to be an abundance of suitable alternative habitat in the nearby surrounding area to which birds may be displaced. Moreover, it is expected that birds will rapidly become habituated to the low level noise which is predicted to emanate into the more sensitive areas surrounding the development site during the construction works, such that any displaced birds are anticipated to return within a relatively short period of time. Consequently, it is expected that this conservation objective would be maintained.

5 ASSESSMENT OF IN-COMBINATION EFFECTS WITH OTHER PLANS AND PROJECTS

Despite the changes in the construction programme timescale and the airborne emissions resulting from the facilities revised design and operating hours, the in-combination assessment presented in the original sHRA is considered to remain relevant. Consequently, the in-combination assessment has not been revised in this addendum.

6 MONITORING AND MITIGATION

6.1 Monitoring

At the request of RSPB, a programme of at least four waterbird surveys will be undertaken in October 2019 to provide a record of waterbird diversity and abundance and to monitor any disturbance impacts during the initial stages of core external construction works (including piling). The surveys will cover the same area and follow the same methods used in the 2018/19 winter wetland bird surveys (as detailed above). The data collected during this monitoring will be reported to Natural England and RSPB on a weekly basis.

In addition, an Ecological Clerk of Works (ECoW) will monitor bird/noise interactions throughout the construction period at a frequency which is commensurate with the nature and intensity of works being undertaken. For example, monitoring will be more frequent during piling activities than during internal outfitting and electrical works.

6.2 Mitigation

In the event that pSPA/SPA qualifying species or large numbers of the waterbird assemblage are observed within areas predicted to experience noise disturbance >55dB (as shown on Figures 7, 8 & 9) or where continued noise monitoring shows a change in predicted levels to that modelled, the Principal Contractor and the ECoW will discuss and agree an appropriate form of mitigation. This could be in the form of avoiding works at particular times of the day, until the birds have moved away of their own accord or appropriate noise screening being used. The design and efficacy of which should be agreed between the Principal Contractor and the ECoW.

Subsequent to whatever action is taken, the ECoW will monitor bird activity and any disturbance responses upon resumption of works to identify its effectiveness and, if necessary, the requirement for any design modifications or amendments to the working methods.

7 CONCLUSIONS

This document has considered the potential for significant impacts arising from the revised construction programme and the airborne emissions resulting from the facilities' revised design and operating hours for Statera's consented gas-fired electricity generating facilities near Saltholme that would have the potential to adversely affect any European (Natura 2000) designated sites of nature conservation interest, particularly with regard to their qualifying interests and conservation objectives. It is submitted as a third version addendum to the original sHRA upon which the site was consented.

Of the impacts which are anticipated to occur during the construction phase, only noise and visual disturbance have the potential to change due to the revised construction programme with civil and external construction works being scheduled to occur during what is considered to be the more sensitive overwintering bird period. Meanwhile the revised assessment only considers the potential impacts of air emissions associated with the operational phase.

Following reconsideration of the potential pathways by which adverse impacts may potentially occur as a result of the revised construction programme and operational processes the only designated sites for which there may be likely signiticant effects are the Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/pRamsar Site.

Through a combination of consultation and field survey data it has been shown that the fields associated with and immediately surrounding the development site are of limited value to waterbirds associated with the SPA/pSPA. Even the habitats associated with the nearest part of the pSPA to the development site are of limited value to wetland birds. The majority of such species use the pools and grassland habitats associated with the wider RSPB Saltholme Reserve in areas located over 230m south of the nearest part of the development site (the grid connection cable route) and over 300m from the main development site itself.

With regards to consideration of the potential impacts of visual disturbance during construction, the areas where the majority of wetland birds associated with the SPA/pSPA and Ramsar/pRamsar Site occur (i.e. predominantly the pools and grassland areas within the Saltholme Reserve) are located at least 300m from the main development site and hence beyond the distance within which more disturbance sensitive species are expected to be affected. Regarding the grid connection cable installation works which occur within the 300m disturbance distance, these ground level activities are expected to be largely obscured from the birds at the favoured pools and grassland areas by the topographical variation and the presence of the intervening gas pipeline. Even if some birds were to be disturbed by visual stimuli, such effects are expected to be localised and temporary with any displaced birds being able to find suitable alternative habitat in the nearby surrounding area and most likely returning after a short period of habituation.

With regards to the potential impacts of noise disturbance during construction, the CFA piling and generic construction activities are expected to generate noise levels which are within the acceptable disturbance threshold in the areas where the majority of wetland birds associated with the SPA/pSPA and Ramsar/pRamsar Site occur. Regarding the grid connection cable installation works which would take place within the Teesmouth and Cleveland Coast pSPA and pRamsar Site, the peak 'at source' noise levels (i.e. within the pSPA and pRamsar Site) would be above the acceptable disturbance threshold. However, in the areas where the majority of wetland birds associated with the SPA/pSPA and Ramsar/pRamsar Site occur, noise levels are predicted to be dissipated below the acceptable disturbance threshold. As with visual disturbance, even if some birds were to be disturbed by noise, such effects are expected to be localised and temporary with any displaced birds being able to find suitable alternative habitat in the nearby surrounding area and most likely returning after a short period of habituation.

The revised design and operating schedule of the facilities are predicted to contribute to airborne N, NOx, NH_3 and acid deposition concentrations which will exceed critical thresholds. In identifying this, it is noteworthy that the baseline N and NOx concentrations for the area already exceed critical thresholds. With regards to how these threshold exceedances may affect the habitats, and hence species, associated with the Teesmouth and Cleveland Coast SPA/pSPA it is concluded that they are either located far enough away to be affected, are not susceptible to the effects of increased nutrient delivery or the contributions from the

proposed facility would be infinitesimal compared to the natural inputs which the associated habitats currently receive from the surrounding environment (e.g. riverine, tidal and fertilisation inputs).

Based on the above, it is considered that there is negligible to low potential for any significant effects on SPA/pSPA qualifying species from visual or noise disturbance during construction or air emissions during operation.

No revised in-combination assessment has been undertaken as the one presented in the original sHRA is considered to remain relevant.

Despite the predicted negligible to low significance of potential effects, a programme of bird/noise interaction monitoring is proposed during the construction programme. This will aim to record the diversity and abundance of waterbird in proximity to the works, determine whether the construction disturbance effects predicted in Section 3 of this sHRA addendum are accurate, and identify the requirement for remedial action or installation of appropriate mitigation.

On the basis of the above, the revised construction programme and operational conditions of the consented development are not predicted to contravene any of the SPA/pSPA's Conservation Objectives. It is therefore concluded, beyond reasonable scientific doubt, that the development will not give rise to significant impacts, either individually or in combination with other plans and projects, in a manner which adversely affects the integrity of any designated site within the Natura 2000 network.

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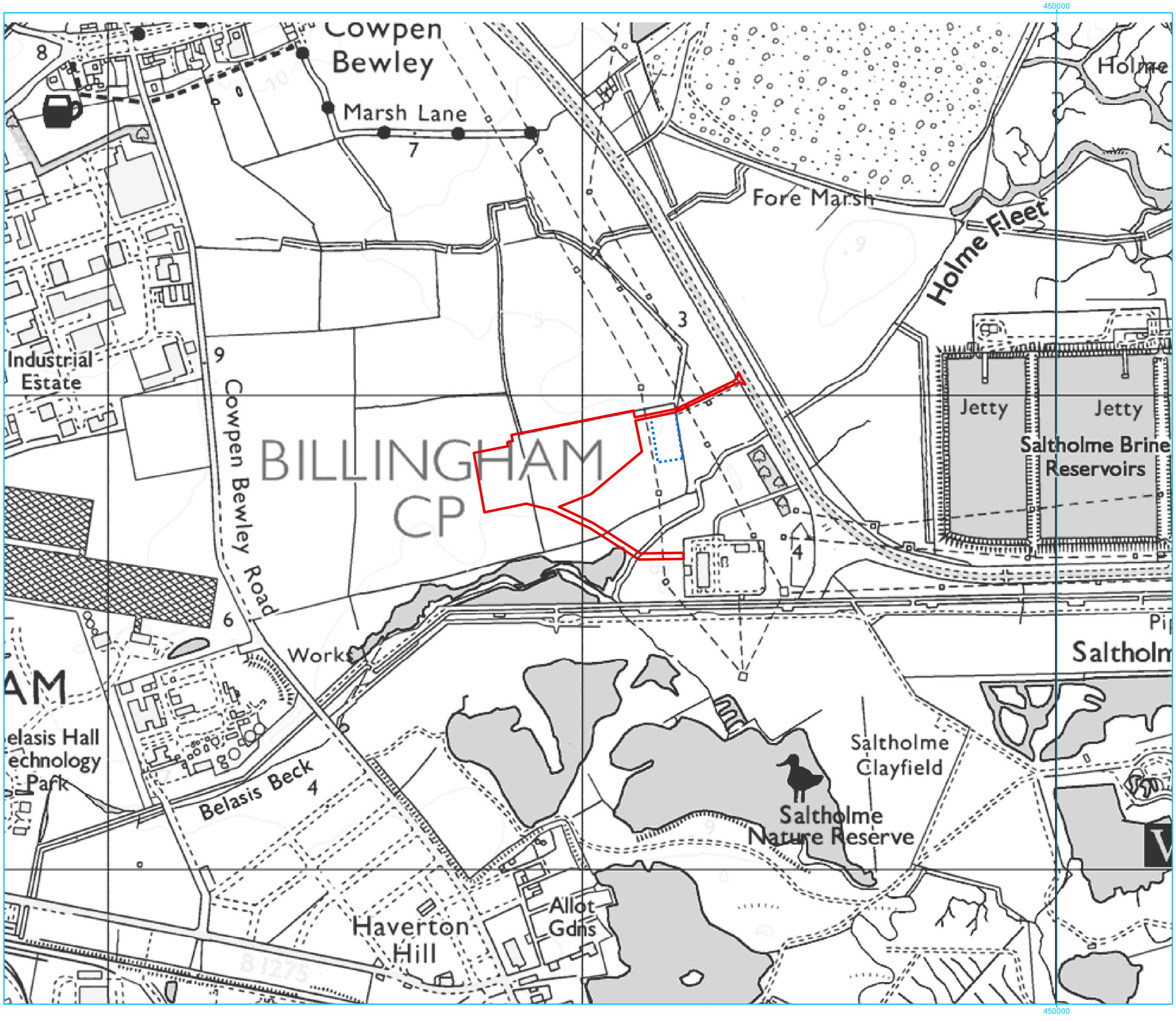
FIGURES

Figure 1: Site location plan
Figure 2: Natura 2000 sites within 1km of the development site
Figure 3: Winter wetland bird survey area
Figures 4a-4d: Winter wetland bird surveys results (waterfowl registrations)
Figures 5a-5d: Winter wetland bird surveys results (waders and other wetland bird registrations)
Figure 6: Winter wetland bird surveys flight activity
Figure 7: Construction phase noise modelling contours (CFA piling)
Figure 8: Construction phase noise modelling contours (generic activities)
Figure 9: Construction phase noise modelling contours (grid connection cable installation)
Figure 10: N Deposition Modelling Contour Map
Figure 11: NOx Modelling Contour Map



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Site boundary

Temporary construction compound

N

0 55 110 220 330 m

Rev	Description	Date	Initial	Checked

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Client: Stratera Energy

Project: Saltholme Peaking Plant

Title: Site Location Plan

Status	Drawn By	PM/Checked By
Issue	KM	TG
Job Ref	**Scale @ A3**	**Date**
SEC8481	1:8,000	MAY 19
Drawing Number		**Rev**
Figure 1		04

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- Site boundary
- 1km from site boundary
- Ramsar site
- Proposed Ramsar site
- Special Protection Area
- Proposed Special Protection Area

Teesmouth and Cleveland Coast Extension
Teesmouth and Cleveland Coast
Teesmouth and Cleveland Coast Extension
Teesmouth and Cleveland Coast
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Teesmouth and Cleveland Coast Extension
Teesmouth and Cleveland Coast

N

0 125 250 500 750 m

Rev	Description	By	CB	Date

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Client: Stratera Energy

Project: Saltholme Peaking Plant

Title: Natura 2000 sites within 1km of the development site

Status	Drawn By	PM/Checked By
Issue	KM	TG
Project Number	**Scale @ A3**	**Date Created**
SEC8481	1:18,500	28/05/19
Figure Number		**Rev**
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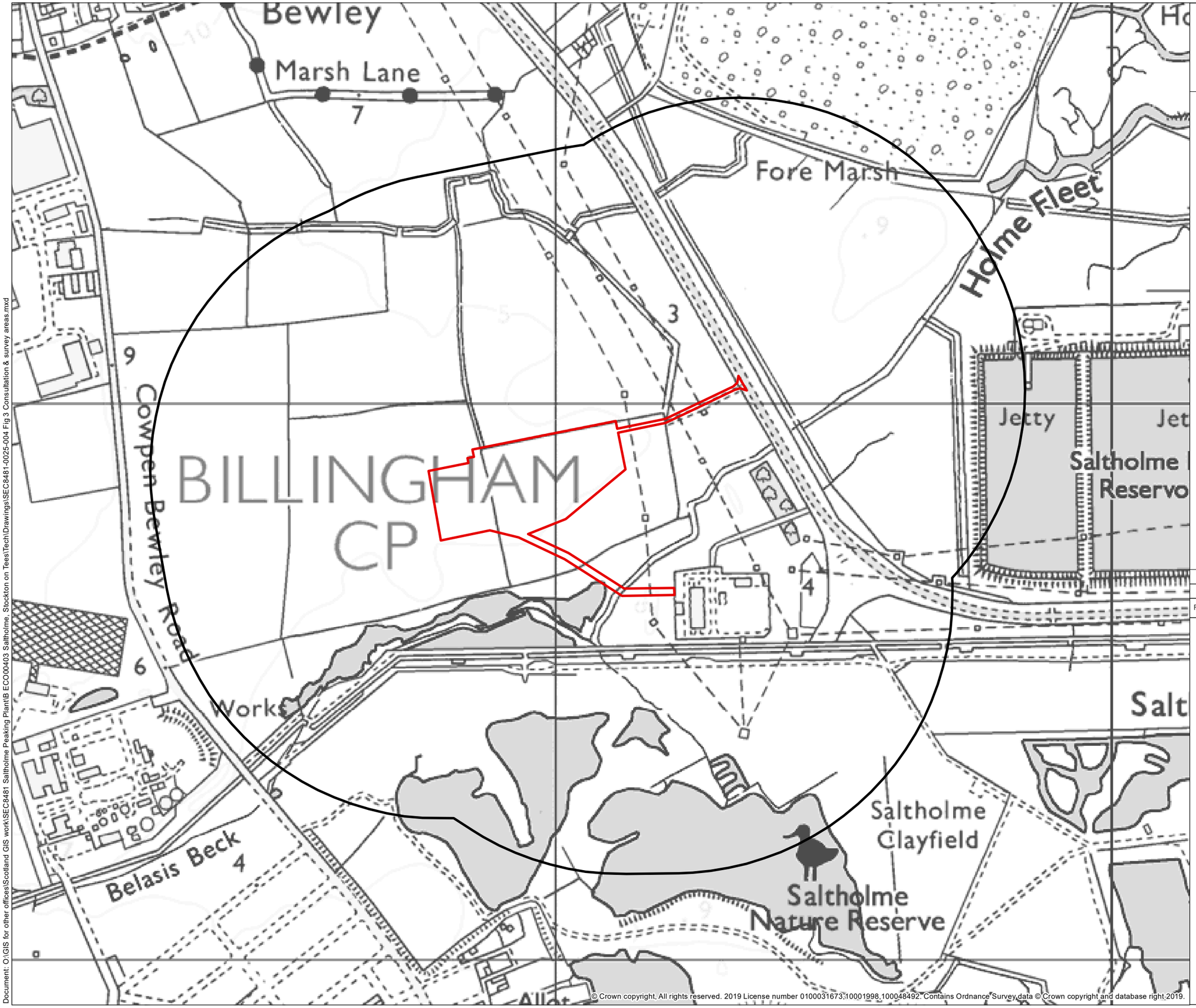

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Site boundary

Wetland bird 500m survey buffer

N

0 40 80 160 240 m

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Client: Stratera Energy

Project: Saltholme Peaking Plant

Title: Winter wetland bird survey area

Status	Drawn By	PM/Checked By
Issue	KM	TG
Project Number	**Scale @ A3**	**Date Created**
SEC8481	1:6,500	28/05/19

Figure Number: **3**

Rev: **04**

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Document: O:\GIS for other offices\Scotland GIS work\SEC8481 Saltholme Peaking Plant\B ECO00403 Saltholme, Stockton on Tees\Tech\Drawings\SEC8481-0025-004 Fig 3 Consultation & survey areas.mxd

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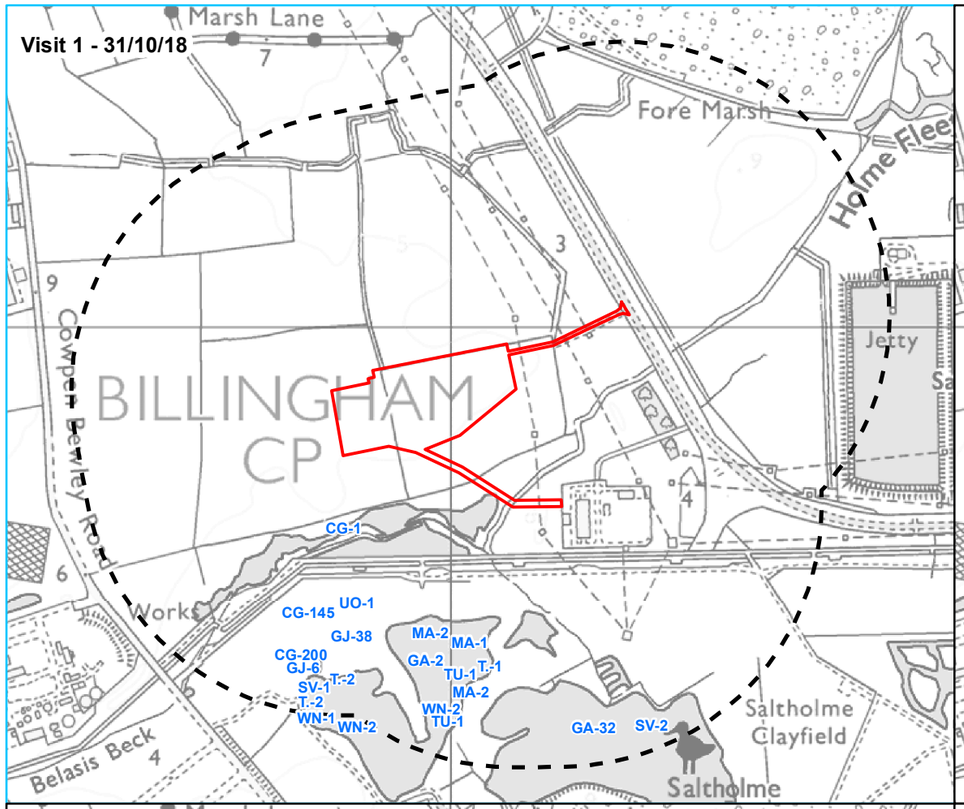

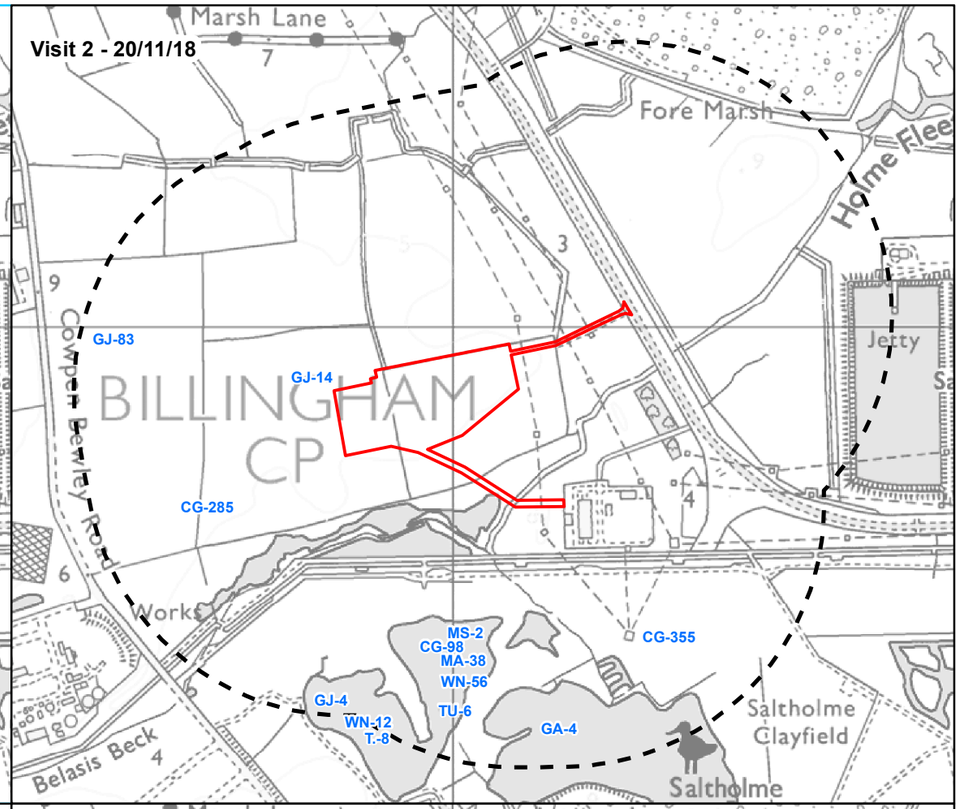

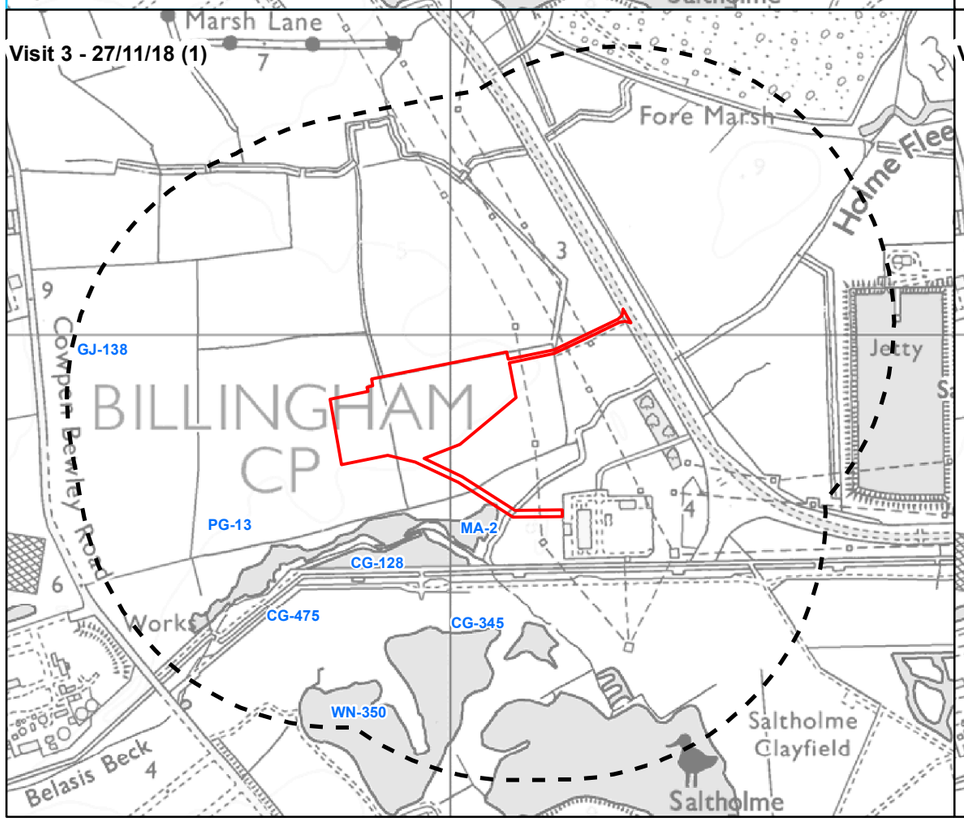

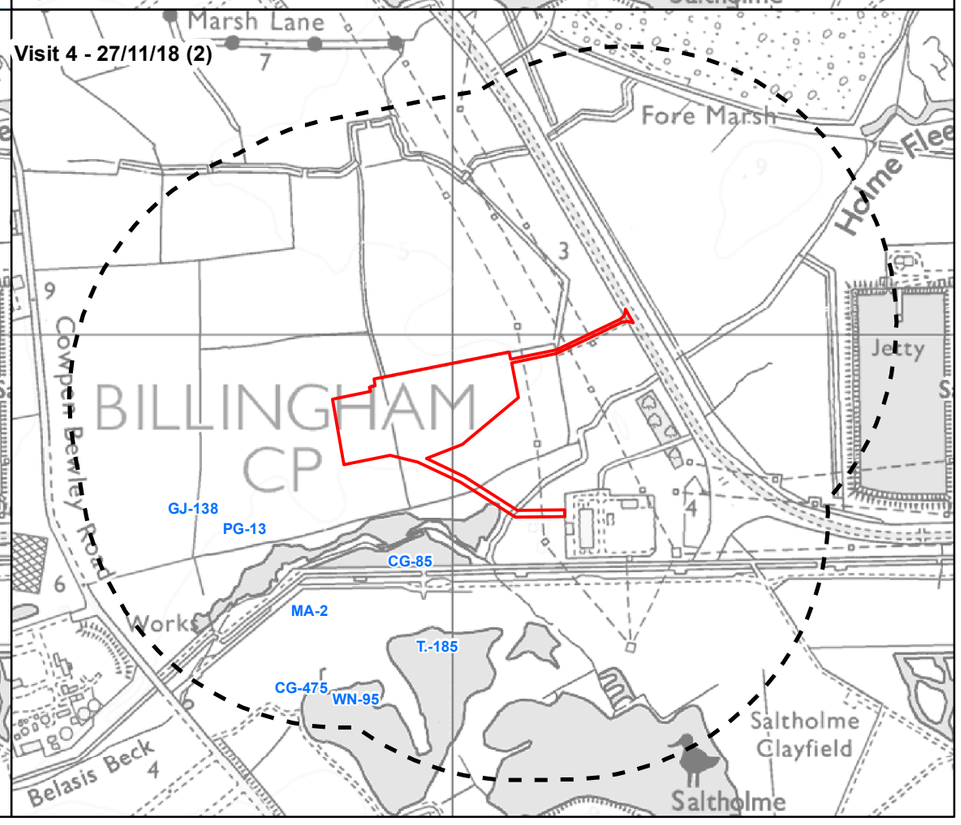

Site boundary
500m from site boundary

CG	Canada Goose
GA	Gadwall
GJ	Greylag Goose
MA	Mallard
MS	Mute Swan
PG	Pink-footed Goose
SU	Shelduck
SV	Shoveler
T.	Teal
TU	Tufted Duck
UO	Unidentified goose
WN	Wigeon
WS	Whooper Swan

N

0 80 160 320 480 m

Rev	Description	Date	Initial	Checked

MAKING COMPLEX EASY

Belford House, 3rd Floor, 59 Belford Road, Edinburgh, EH4 3UE
T: 01315 555 011 **E**: rpsed2@rpsgroup.com **F**: 01315 554 911

Client: Stratera Energy

Project: Saltholme Peaking Plant

Title: Winter Wetland Bird Survey Results (Waterfowl Registrations)

Status	Drawn By	PM/Checked By
Issue	KM	TG
Job Ref	**Scale @ A3**	**Date**
SEC8481	1:11,773	MAY 19
Drawing Number		**Rev**
Figure 4a		02

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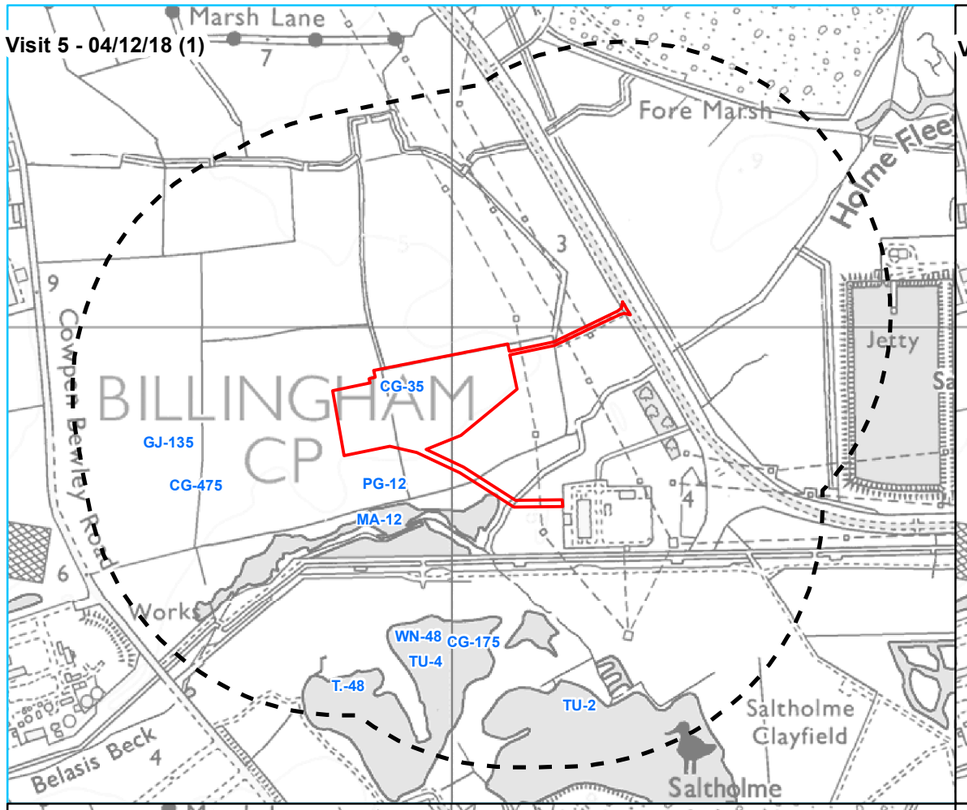

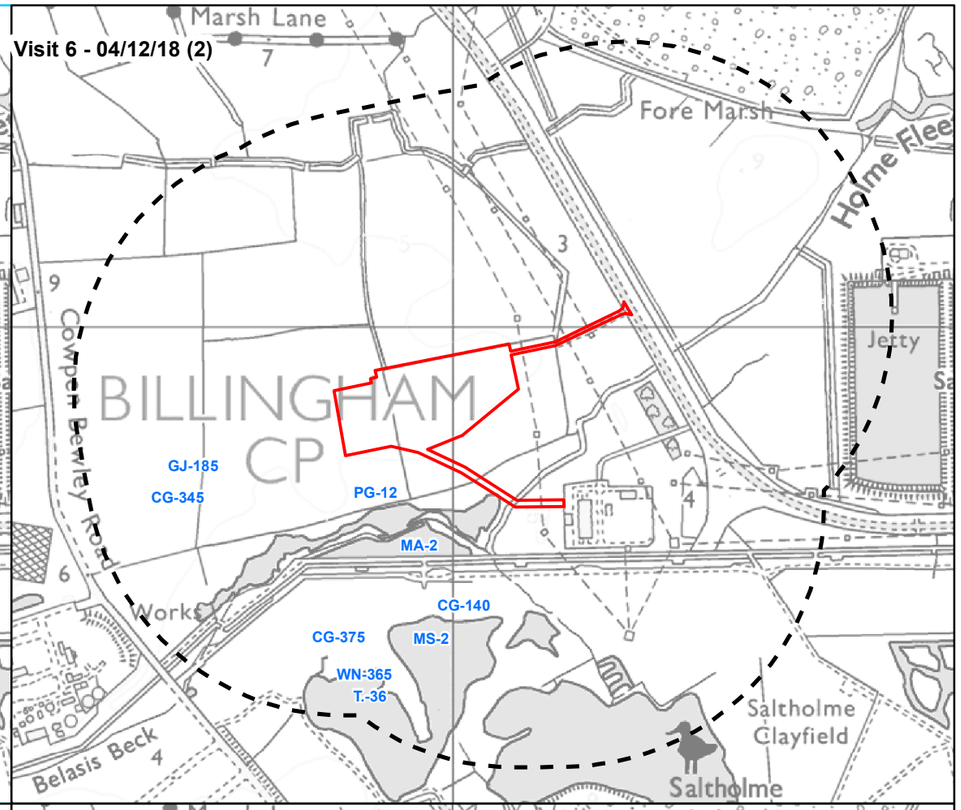

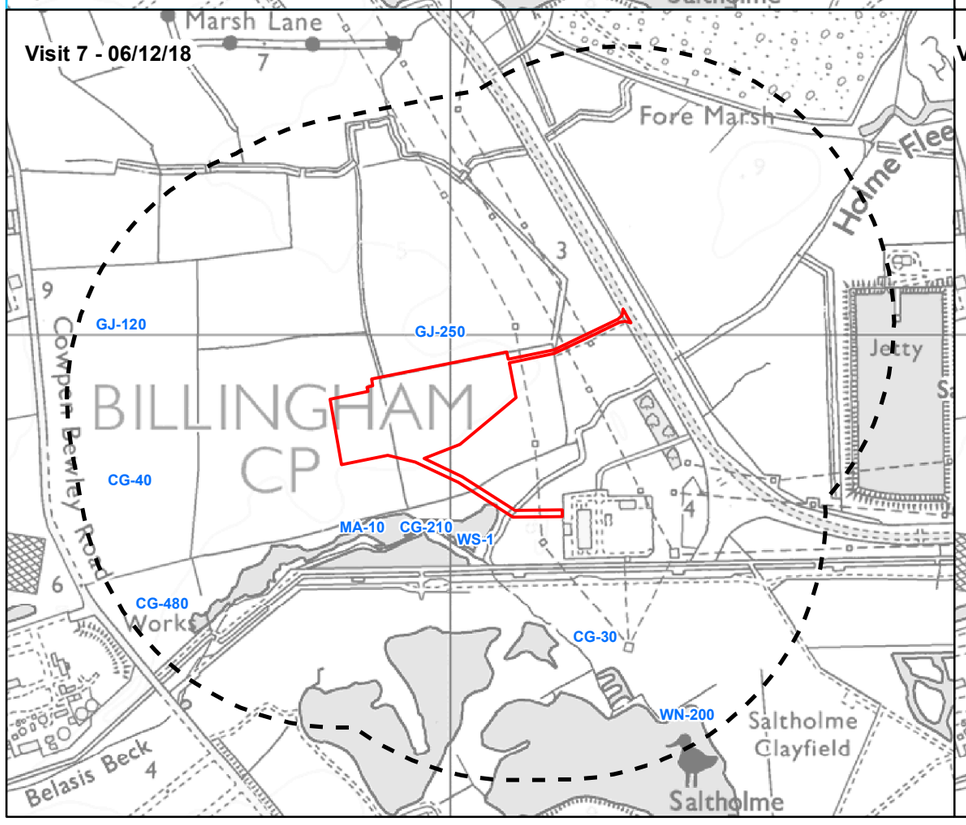

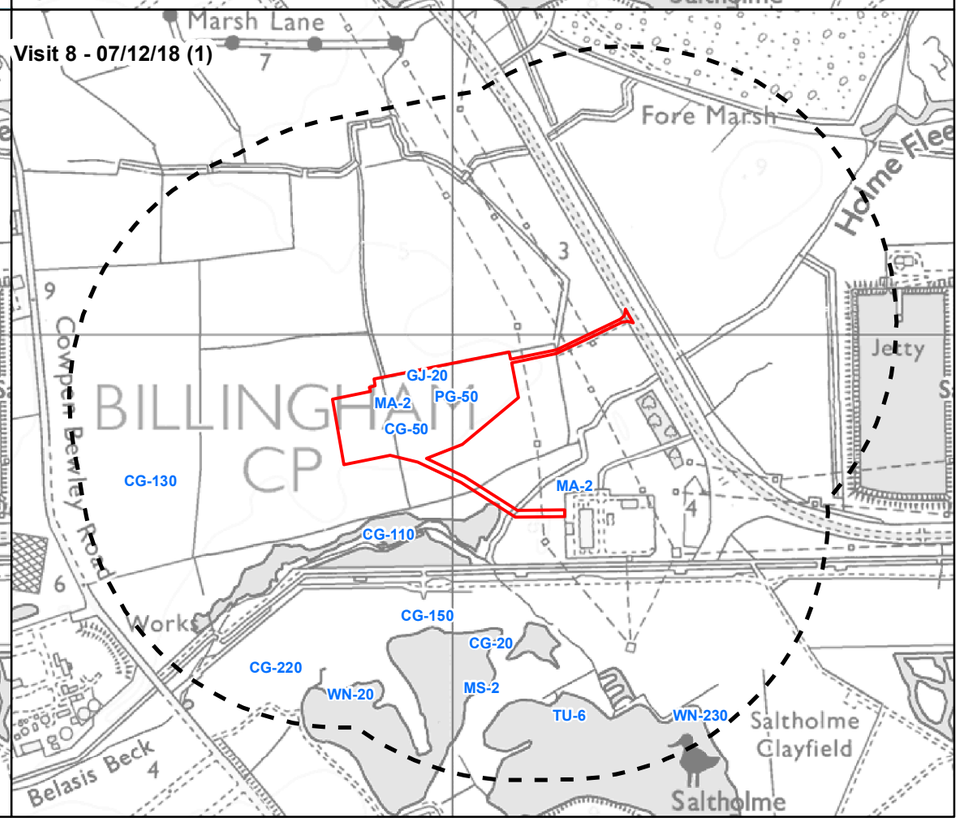

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Site boundary
500m from site boundary

CG Canada Goose
GA Gadwall
GJ Greylag Goose
MA Mallard
MS Mute Swan
PG Pink-footed Goose
SU Shelduck
SV Shoveler
T. Teal
TU Tufted Duck
UO Unidentified goose
WN Wigeon
WS Whooper Swan

N

0 80 160 320 480 m

Rev	Description	Date	Initial	Checked

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Belford House, 3rd Floor, 59 Belford Road, Edinburgh, EH4 3UE
T: 01315 555 011 E: rpsed2@rpsgroup.com F: 01315 554 911

Client Stratera Energy

Project Saltholme Peaking Plant

Title Winter Wetland Bird Survey Results (Waterfowl Registrations)

Status	Drawn By	PM/Checked By
Issue	KM	TG
Job Ref	Scale @ A3	Date
SEC8481	1:11,773	MAY 19
Drawing Number		Rev
Figure 4b		02

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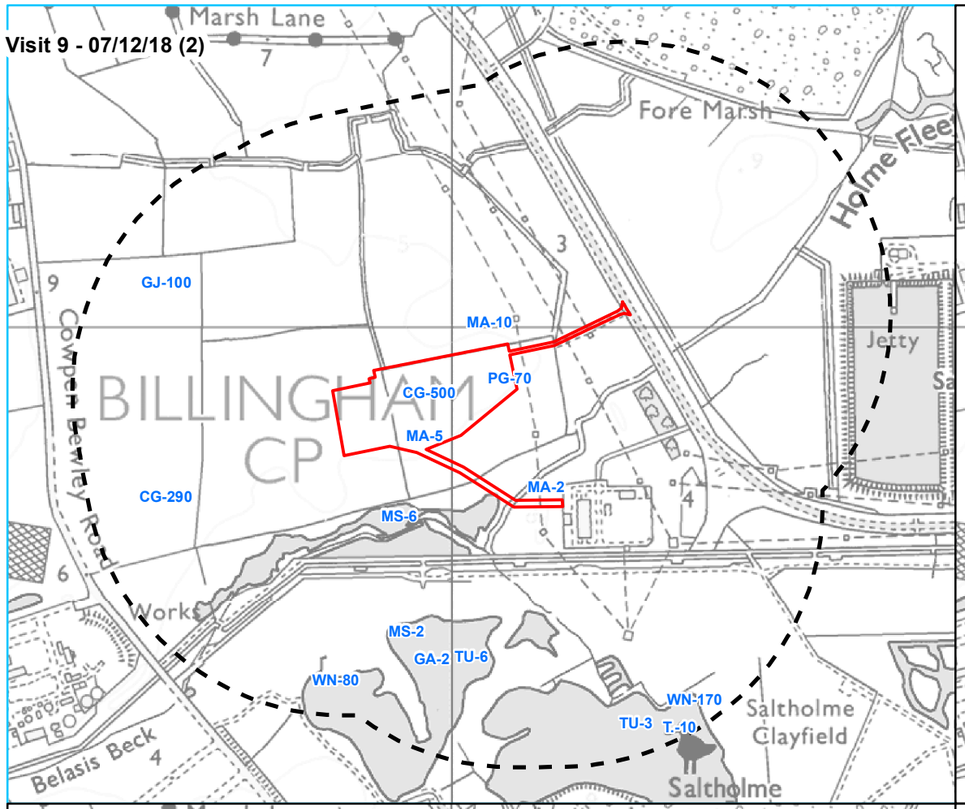

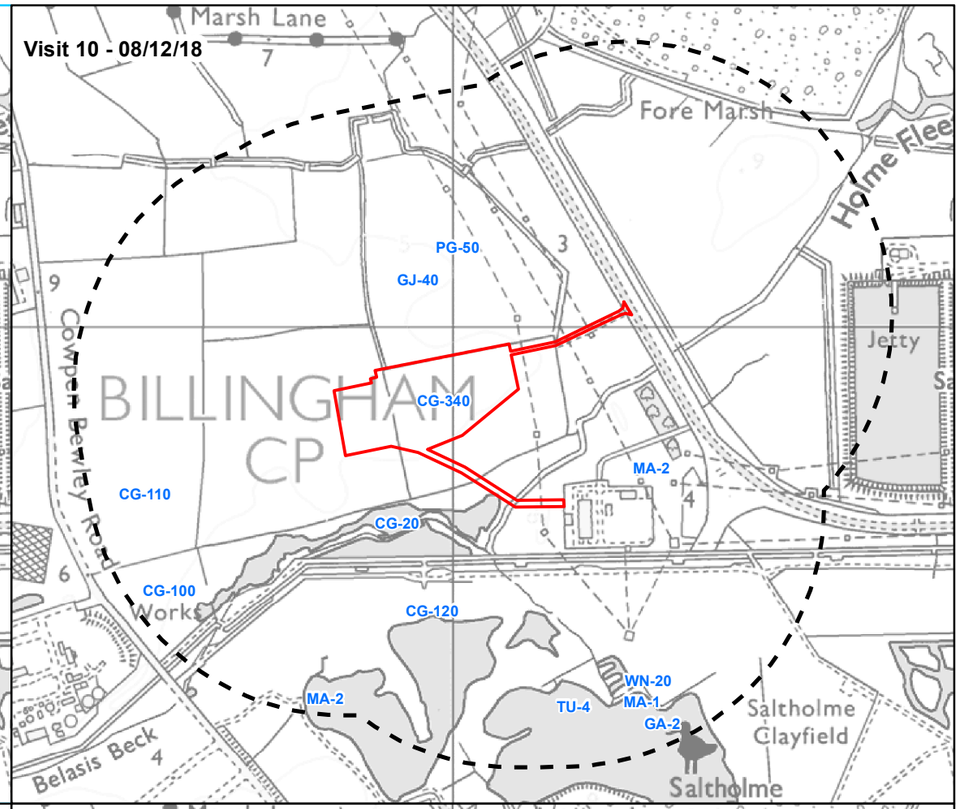

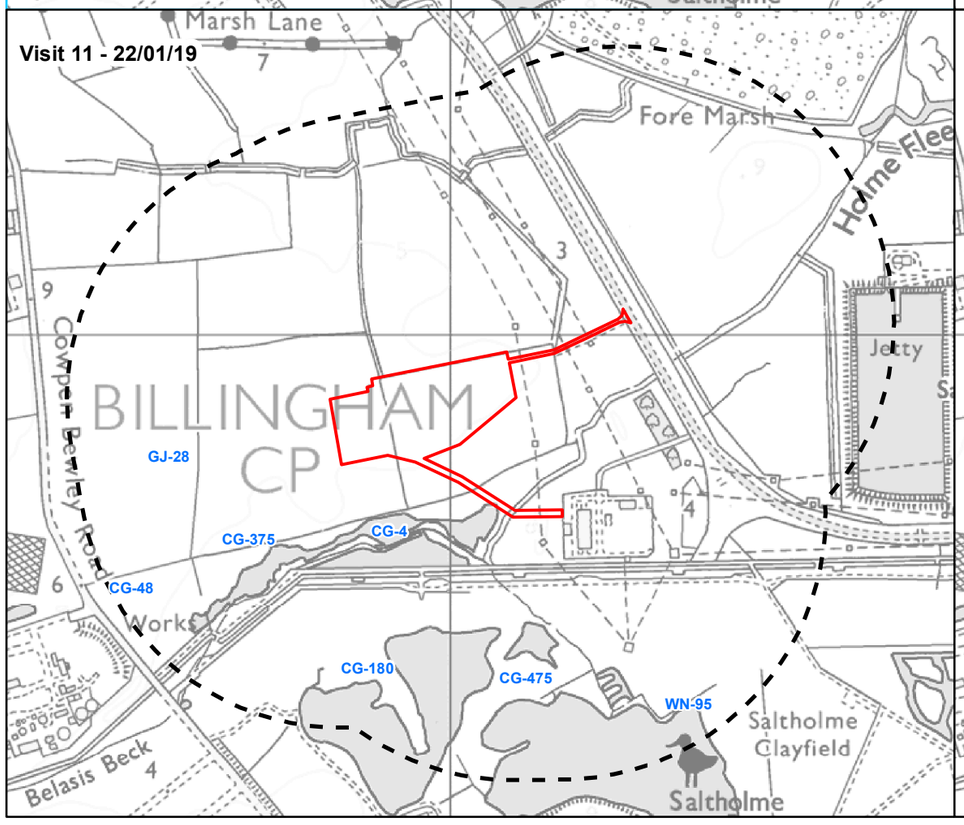

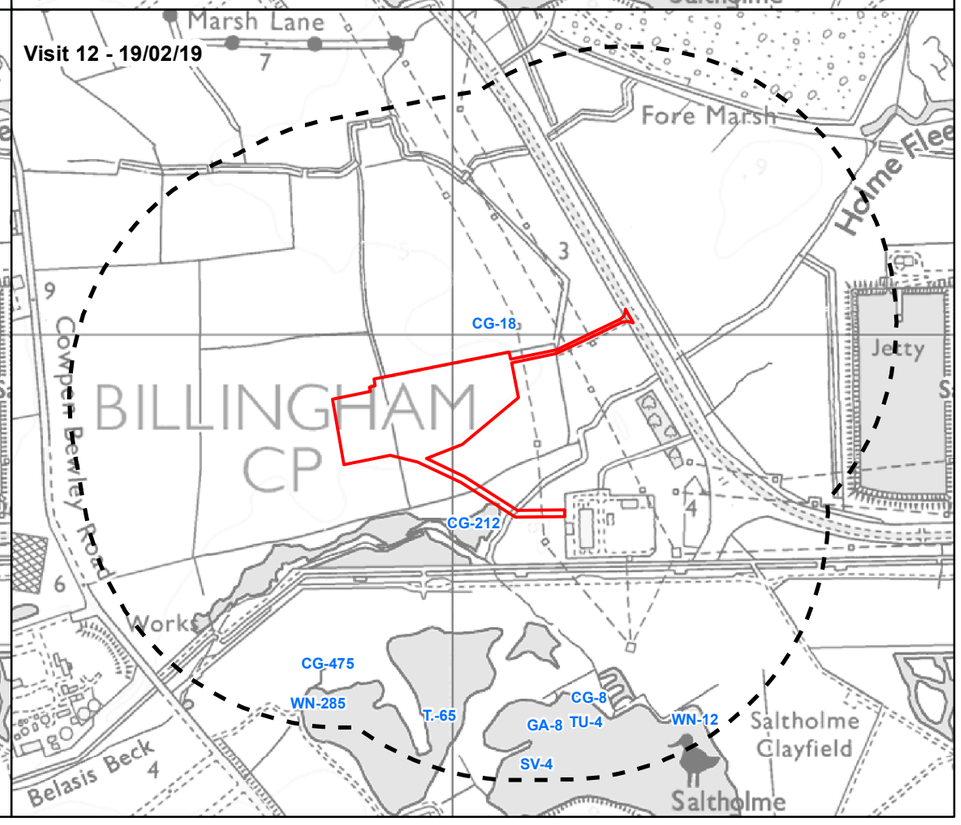

Site boundary
500m from site boundary

CG	Canada Goose
GA	Gadwall
GJ	Greylag Goose
MA	Mallard
MS	Mute Swan
PG	Pink-footed Goose
SU	Shelduck
SV	Shoveler
T.	Teal
TU	Tufted Duck
UO	Unidentified goose
WN	Wigeon
WS	Whooper Swan

N

0 80 160 320 480 m

Rev	Description	Date	Initial	Checked

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Belford House, 3rd Floor, 59 Belford Road, Edinburgh, EH4 3UE
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Client: Stratera Energy

Project: Saltholme Peaking Plant

Title: Winter Wetland Bird Survey Results (Waterfowl Registrations)

Status	Drawn By	PM/Checked By
Issue	KM	TG
Job Ref	**Scale @ A3**	**Date**
SEC8481	1:11,773	MAY 19
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Figure 4c		02

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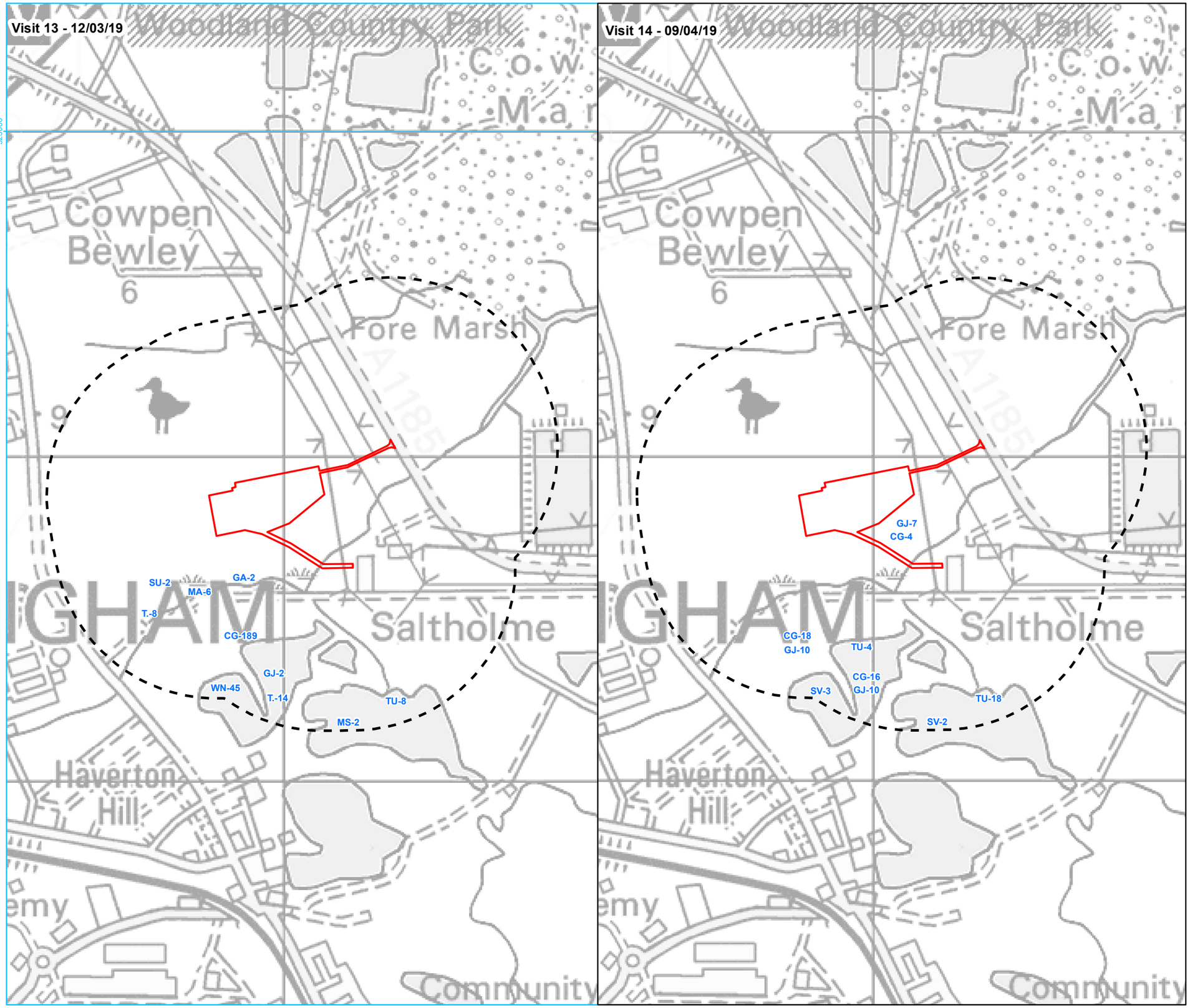

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Site boundary
500m from site boundary

CG Canada Goose
GA Gadwall
GJ Greylag Goose
MA Mallard
MS Mute Swan
PG Pink-footed Goose
SU Shelduck
SV Shoveler
T. Teal
TU Tufted Duck
UO Unidentified goose
WN Wigeon
WS Whooper Swan

N

0 80 160 320 480 m

Rev	Description	Date	Initial	Checked

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Belford House, 3rd Floor, 59 Belford Road, Edinburgh, EH4 3UE
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Client Stratera Energy

Project Saltholme Peaking Plant

Title Winter Wetland Bird Surveys Results (Waterfowl Registrations)

Status	Drawn By	PM/Checked By
Issue	KM	TG
Job Ref	Scale @ A3	Date
SEC8481	1:11,773	MAY 19
Drawing Number		Rev
Figure 4d		02

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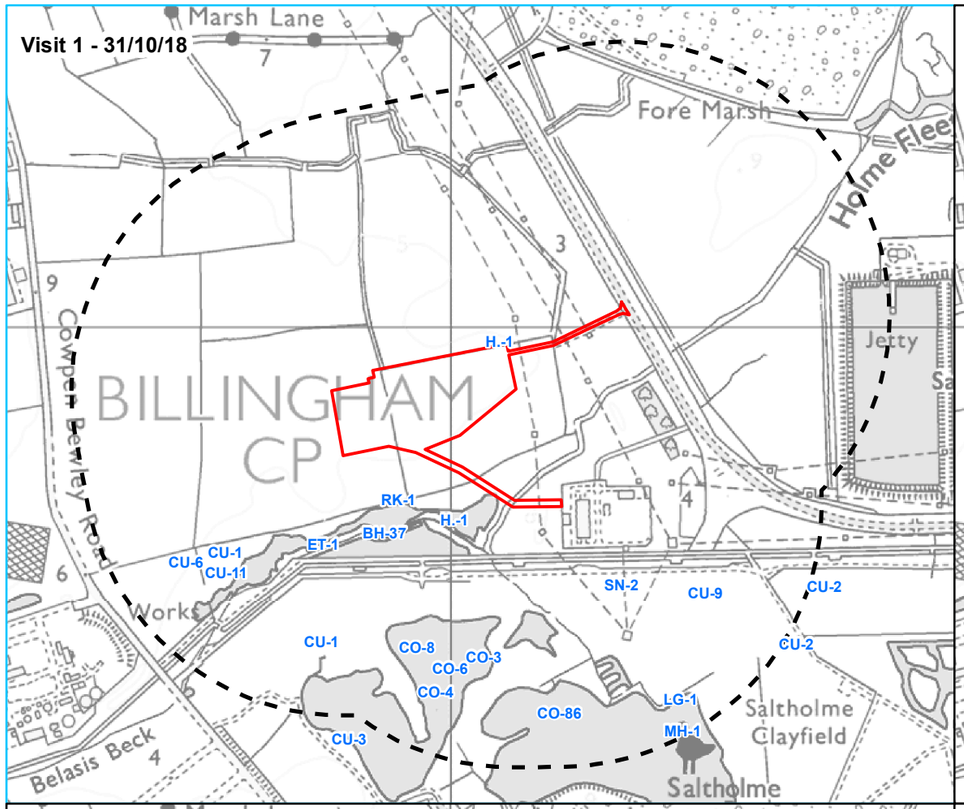

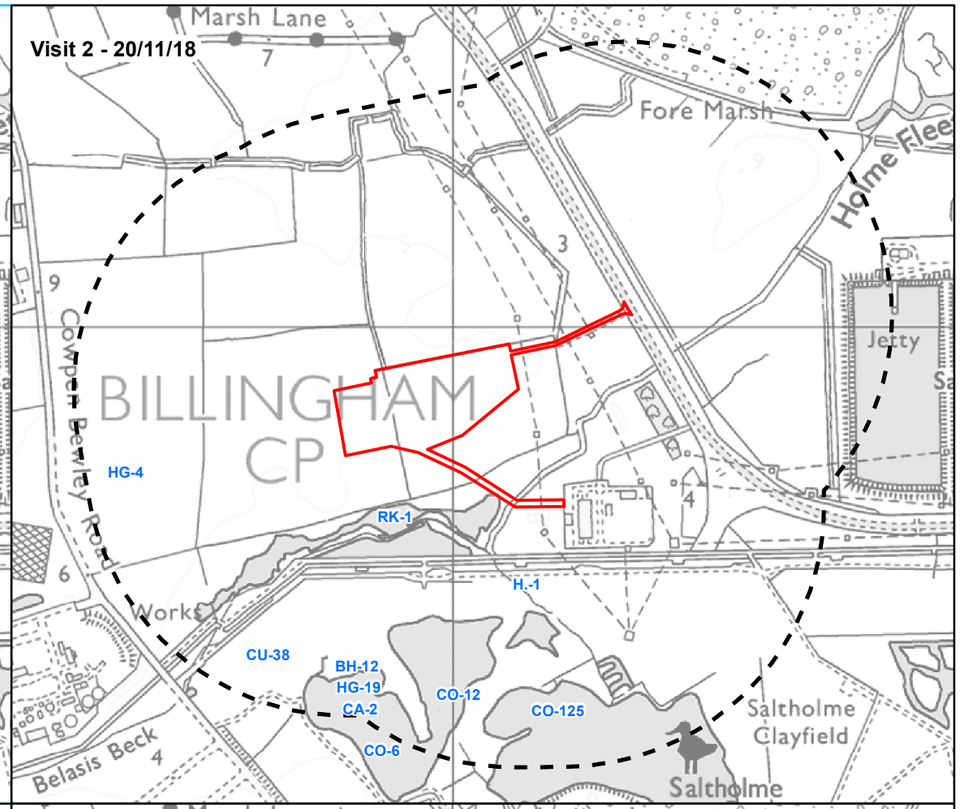

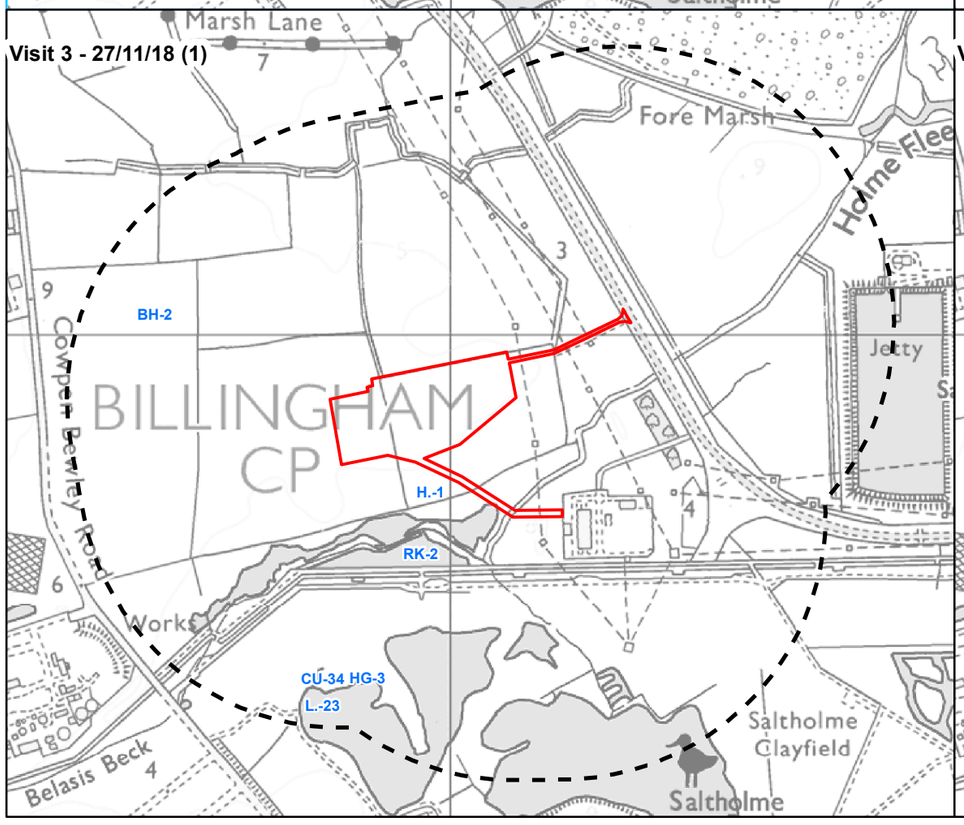

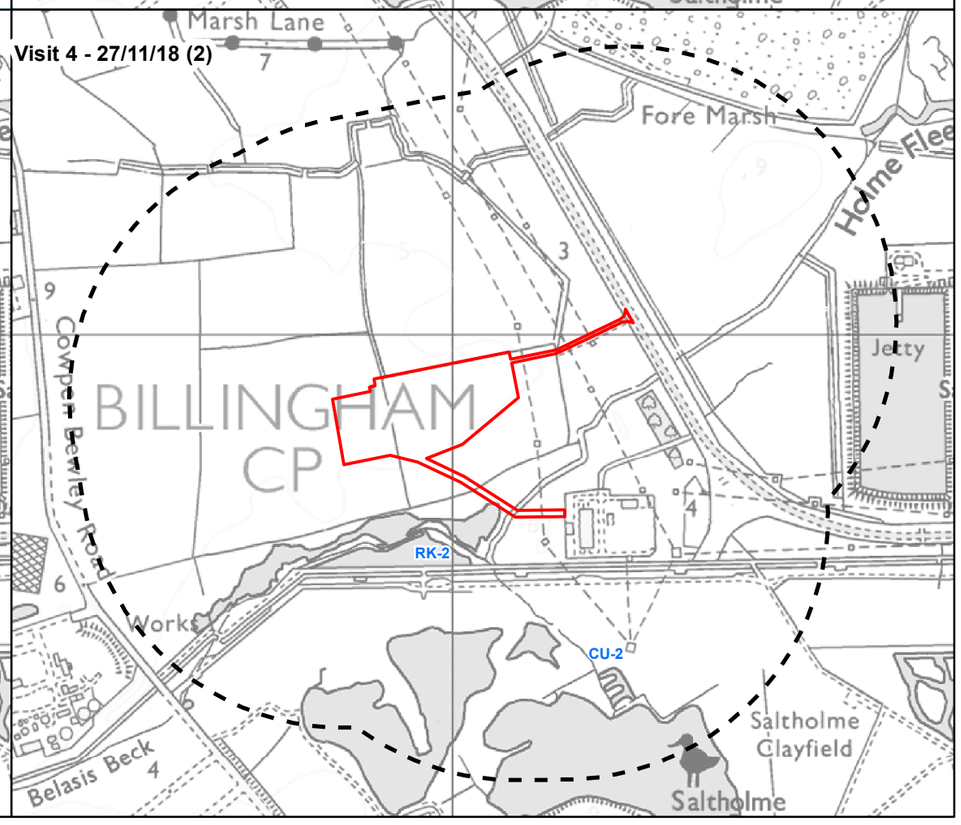

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Site boundary
500m from site boundary

BH Black-headed Gull
CA Cormorant
CM Common Gull
CO Coot
CU Curlew
ET Little Egret
GB Great Black-backed Gull
H. Grey Heron
HG Herring Gull
L. Lapwing
LG Little Grebe
MH Moorhen
OC Oystercatcher
RK Redshank
SN Common Snipe

N

0 80 160 320 480 m

Rev	Description	Date	Initial	Checked

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Belford House, 3rd Floor, 59 Belford Road, Edinburgh, EH4 3UE
T: 01315 555 011 **E**: rpsed2@rpsgroup.com **F**: 01315 554 911

Client Stratera Energy

Project Saltholme Peaking Plant

Title Winter Wetland Bird Surveys (Waders and Other Wetland Birds Registrations)

Status	Drawn By	PM/Checked By
Issue	KM	TG
Job Ref	**Scale @ A3**	**Date**
SEC8481	1:11,773	MAY 19
Drawing Number		**Rev**
Figure 5a		02

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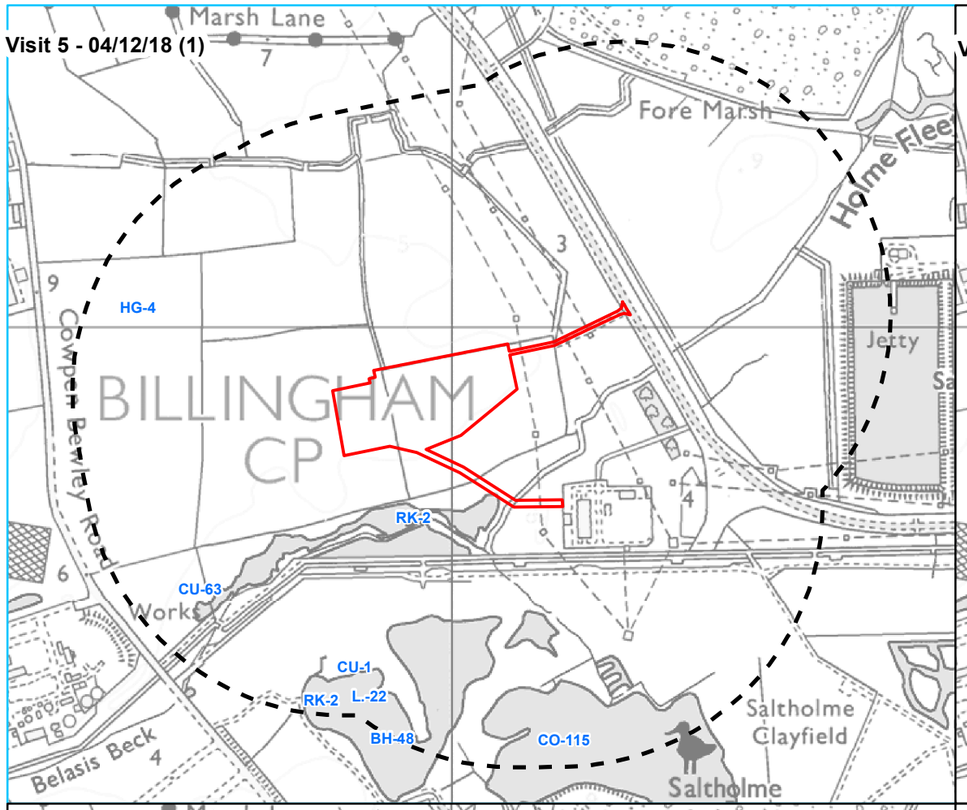

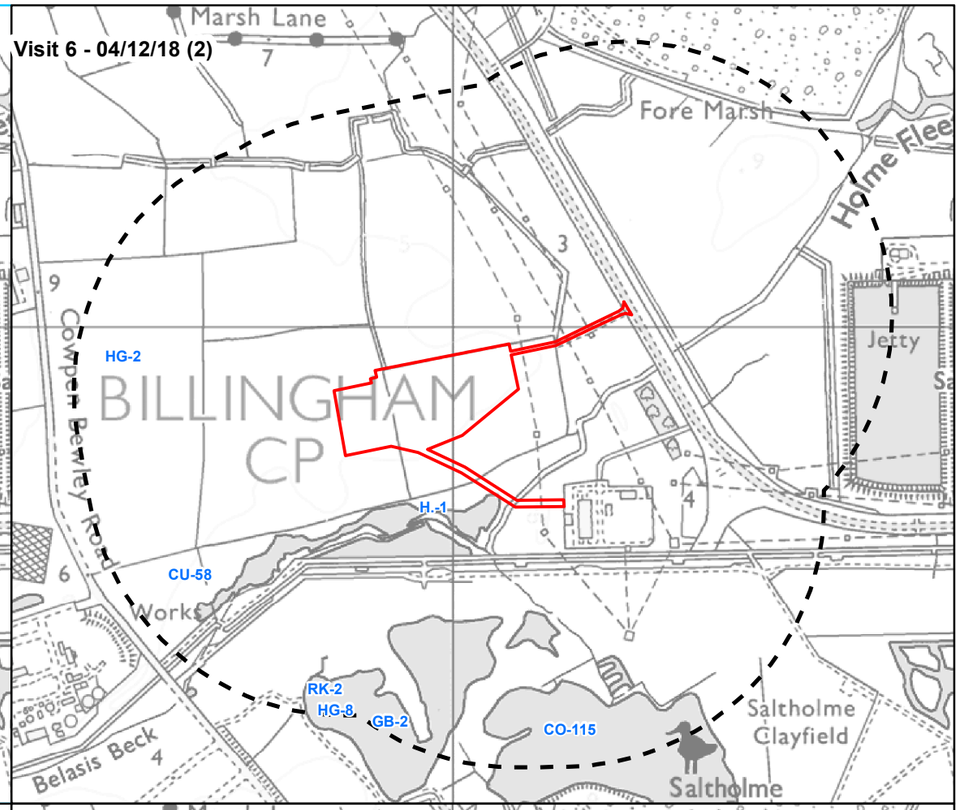

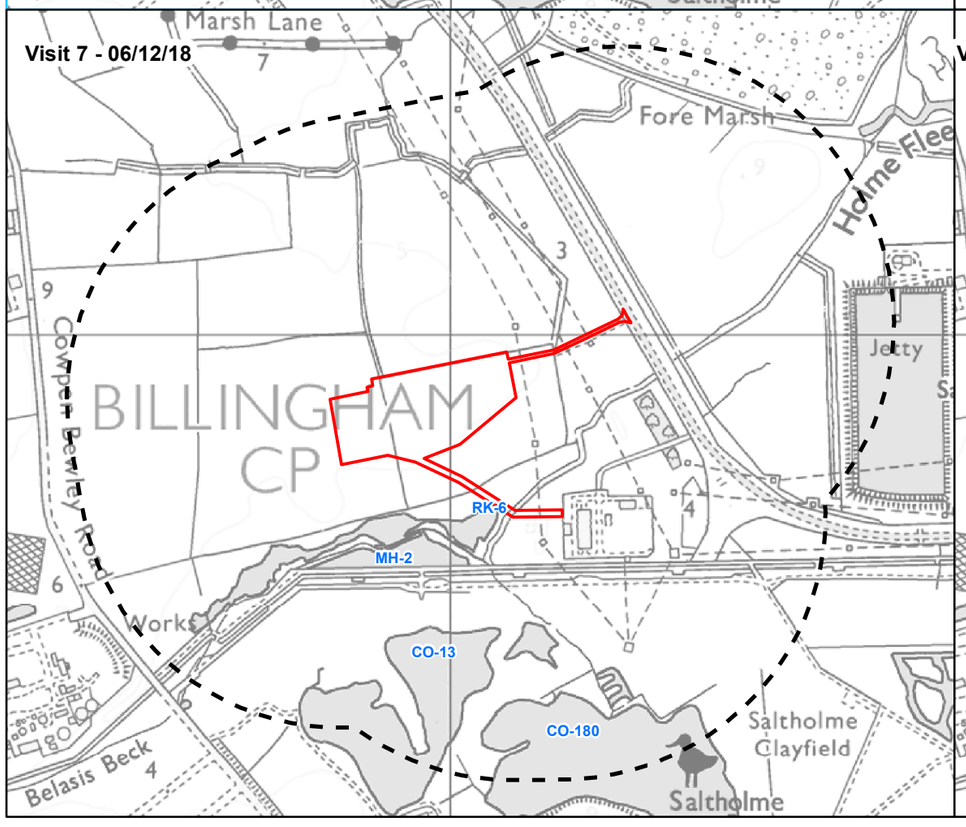

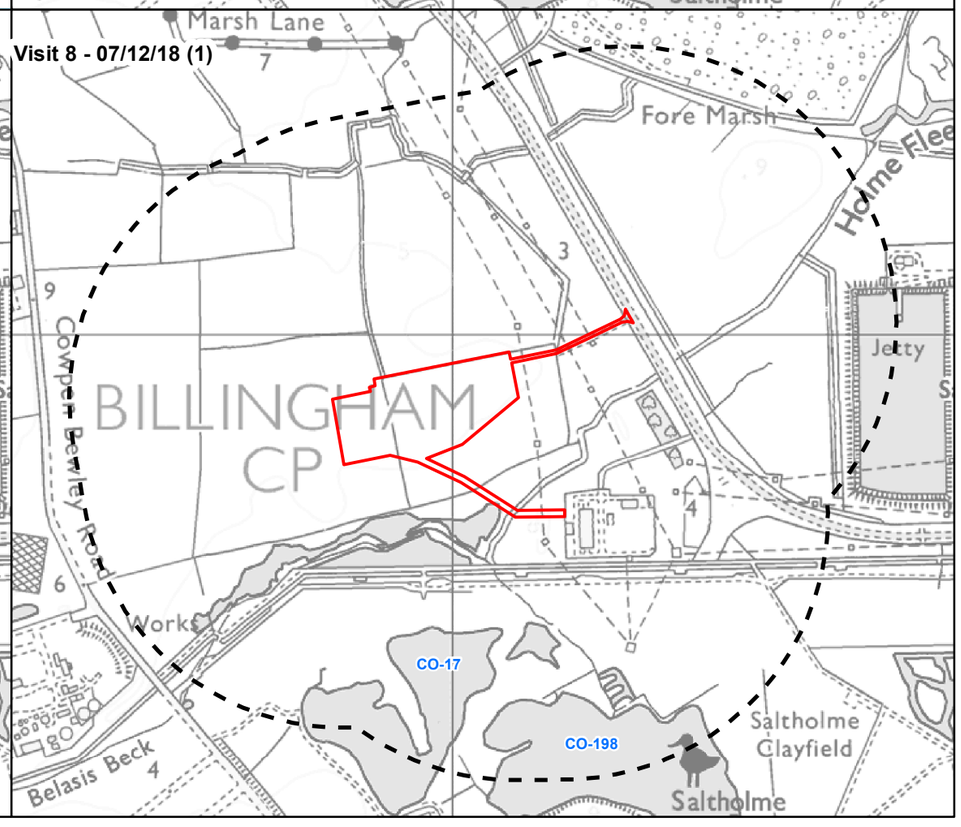

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Site boundary
500m from site boundary

BH	Black-headed Gull
CA	Cormorant
CM	Common Gull
CO	Coot
CU	Curlew
ET	Little Egret
GB	Great Black-backed Gull
H.	Grey Heron
HG	Herring Gull
L.	Lapwing
LG	Little Grebe
MH	Moorhen
OC	Oystercatcher
RK	Redshank
SN	Common Snipe

N

0 80 160 320 480 m

Rev	Description	Date	Initial	Checked

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Belford House, 3rd Floor, 59 Belford Road, Edinburgh, EH4 3UE
T: 01315 555 011 **E**: rpsed2@rpsgroup.com **F**: 01315 554 911

Client: Stratera Energy

Project: Saltholme Peaking Plant

Title: Winter Wetland Bird Surveys (Waders and Other Wetland Birds Registrations)

Status	Drawn By	PM/Checked By
Issue	KM	TG
Job Ref	**Scale @ A3**	**Date**
SEC8481	1:11,773	MAY 19
Drawing Number		**Rev**
Figure 5b		02

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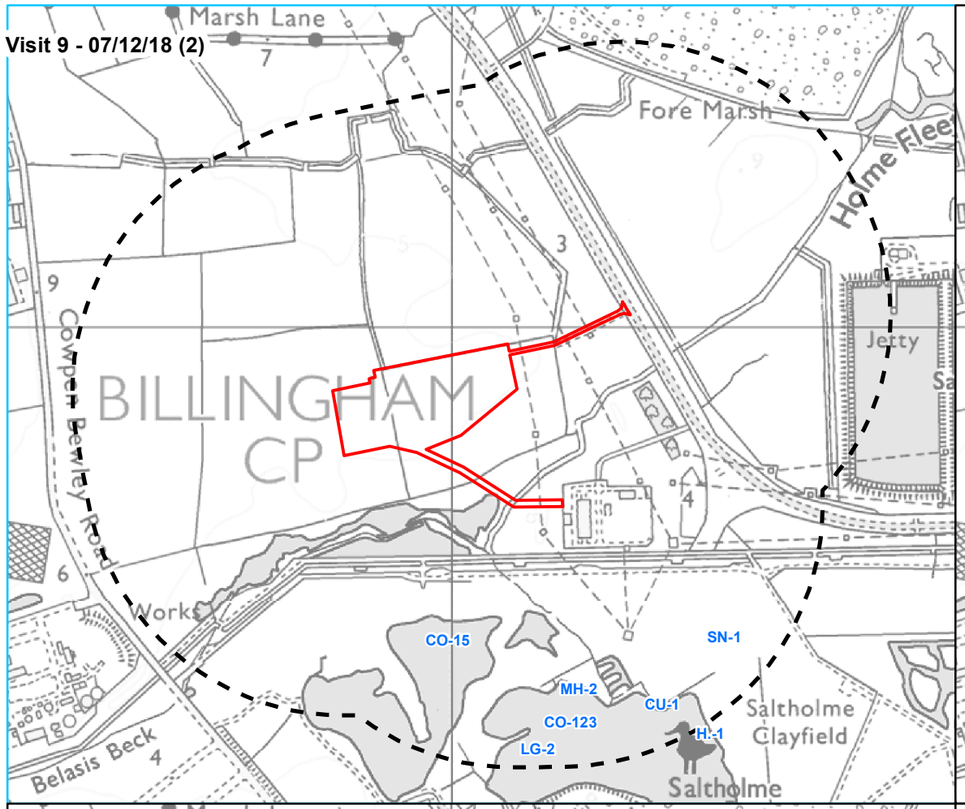

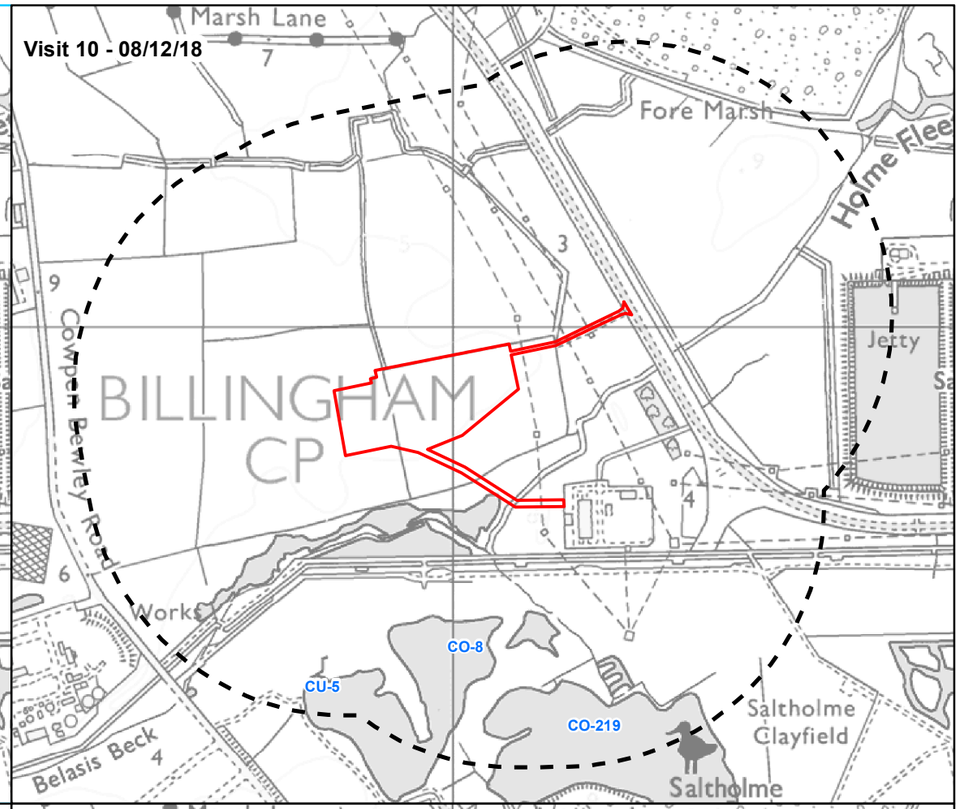

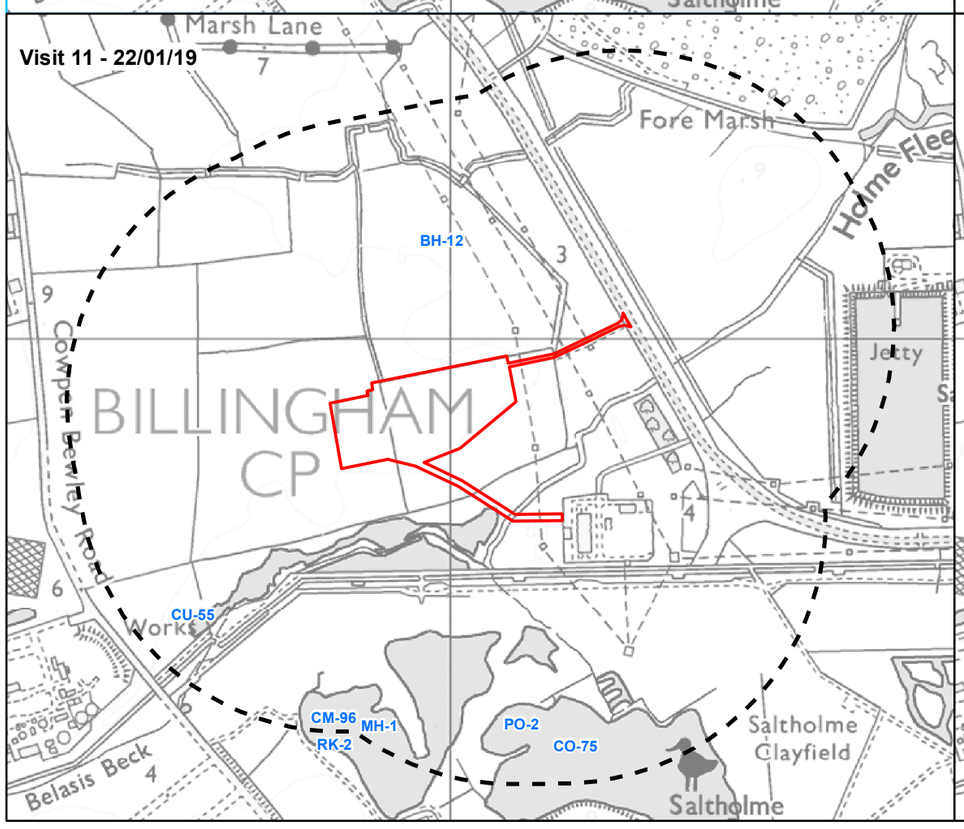

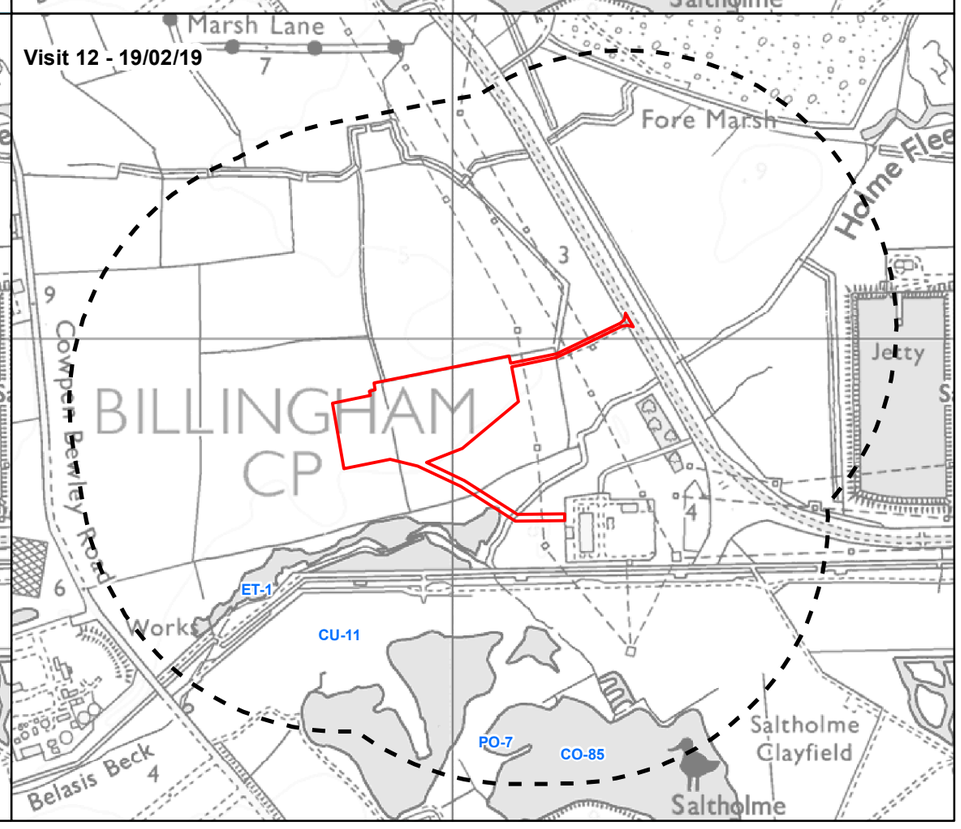

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Site boundary
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BH Black-headed Gull
CA Cormorant
CM Common Gull
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ET Little Egret
GB Great Black-backed Gull
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HG Herring Gull
L. Lapwing
LG Little Grebe
MH Moorhen
OC Oystercatcher
RK Redshank
SN Common Snipe

N

0 80 160 320 480 m

Rev	Description	Date	Initial	Checked

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Belford House, 3rd Floor, 59 Belford Road, Edinburgh, EH4 3UE
T: 01315 555 011 E: rpsed2@rpsgroup.com F: 01315 554 911

Client Stratera Energy

Project Saltholme Peaking Plant

Title Winter Wetland Bird Surveys (Waders and Other Wetland Birds Registrations)

Status	Drawn By	PM/Checked By
Issue	KM	TG
Job Ref	Scale @ A3	Date
SEC8481	1:11,773	MAY 19
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Figure 5c		02

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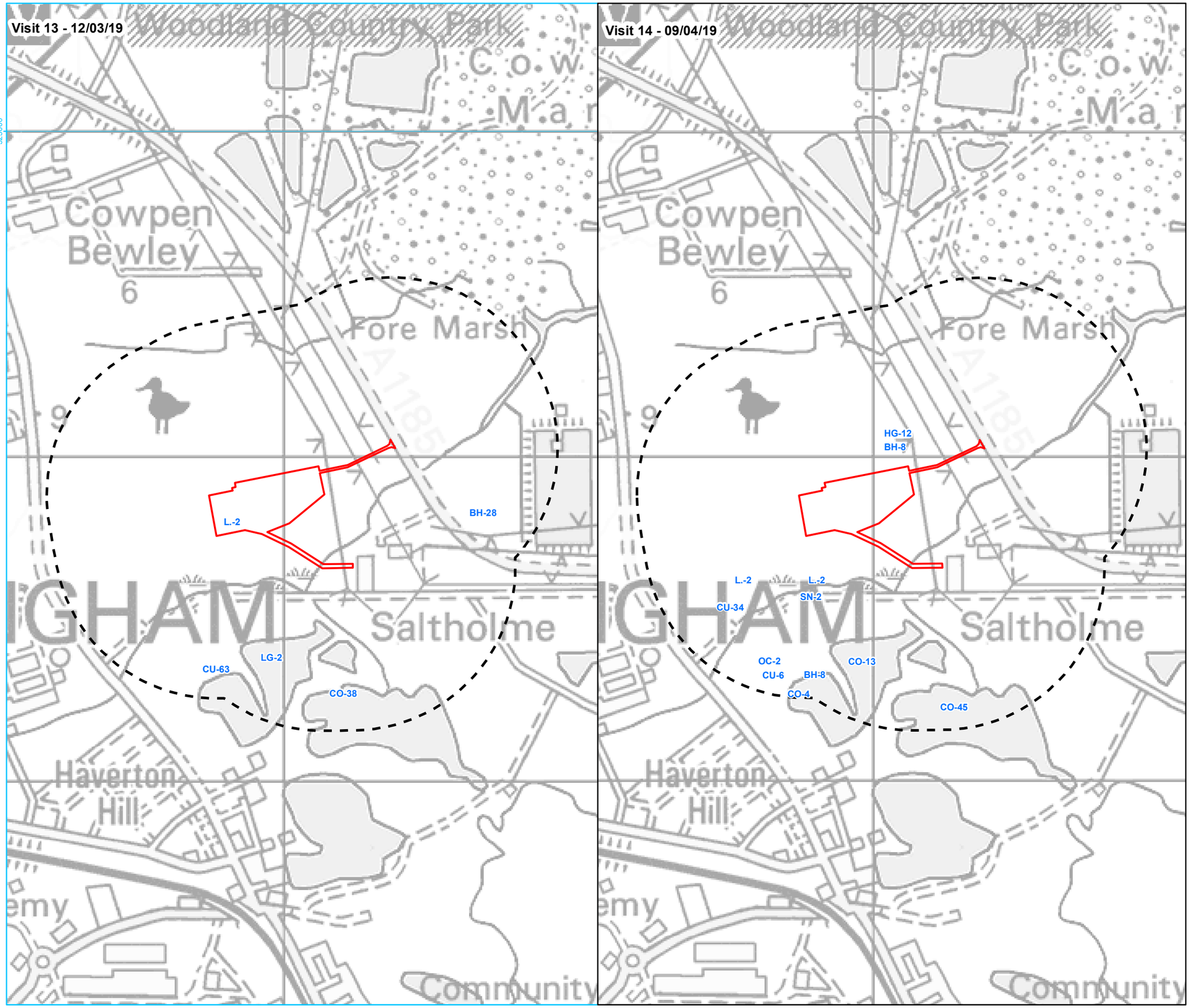

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L. Lapwing
LG Little Grebe
MH Moorhen
OC Oystercatcher
RK Redshank
SN Common Snipe

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0 80 160 320 480 m

Rev	Description	Date	Initial	Checked

MAKING COMPLEX EASY

Belford House, 3rd Floor, 59 Belford Road, Edinburgh, EH4 3UE
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Client Stratera Energy

Project Saltholme Peaking Plant

Title Winter Wetland Bird Surveys (Waders and Other Wetland Birds Registrations)

Status	Drawn By	PM/Checked By
Issue	KM	TG
Job Ref	Scale @ A3	Date
SEC8481	1:11,773	MAY 19
Drawing Number		Rev
Figure 5d		02

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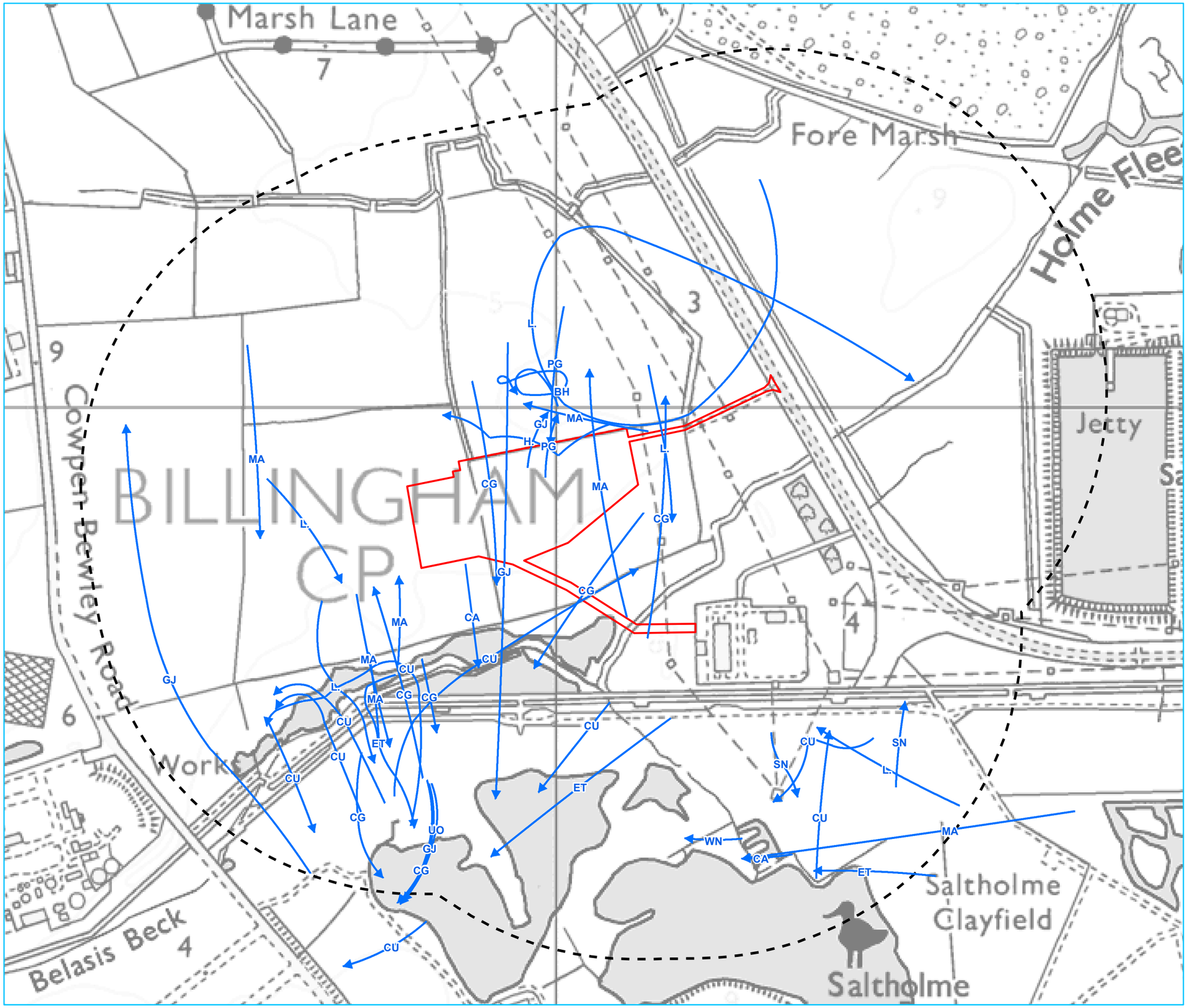

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Site boundary
500m from site boundary
Flight direction

BH Black-headed Gull
CA Cormorant
CG Canada Goose
CU Curlew
ET Little Egret
GJ Greylag Goose
H. Grey Heron
L. Lapwing
MA Mallard
PG Pink-footed Goose
SN Shoveler
UO Unidentified goose
WN Wigeon

N

0 40 80 160 240 m

Rev	Description	Date	Initial	Checked

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Client Stratera Energy

Project Saltholme Peaking Plant

Title Winter Wetland Bird Surveys Flight Activity

Status	Drawn By	PM/Checked By
Issue	KM	TG
Job Ref	Scale @ A3	Date
SEC8481	1:5,862	MAY 19
Drawing Number		Rev
Figure 6		03

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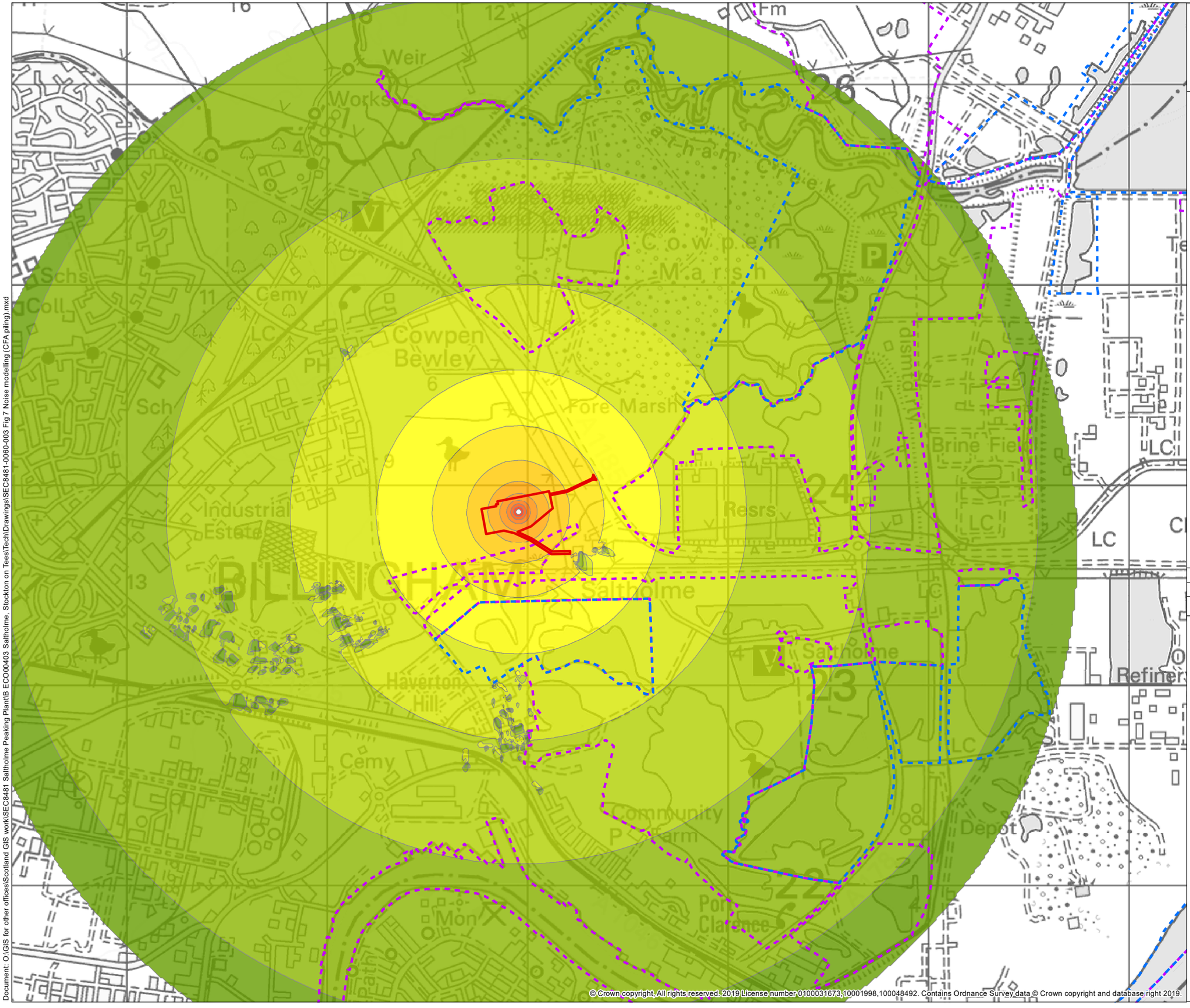

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Client: Stratera Energy

Project: Saltholme Peaking Plant

Title: Construction phase noise modelling contours (CFA piling)

Status	Drawn By	PM/Checked By
Issue	KM	TG
Project Number	**Scale @ A3**	**Date Created**
SEC8481	1:18,000	28/05/19
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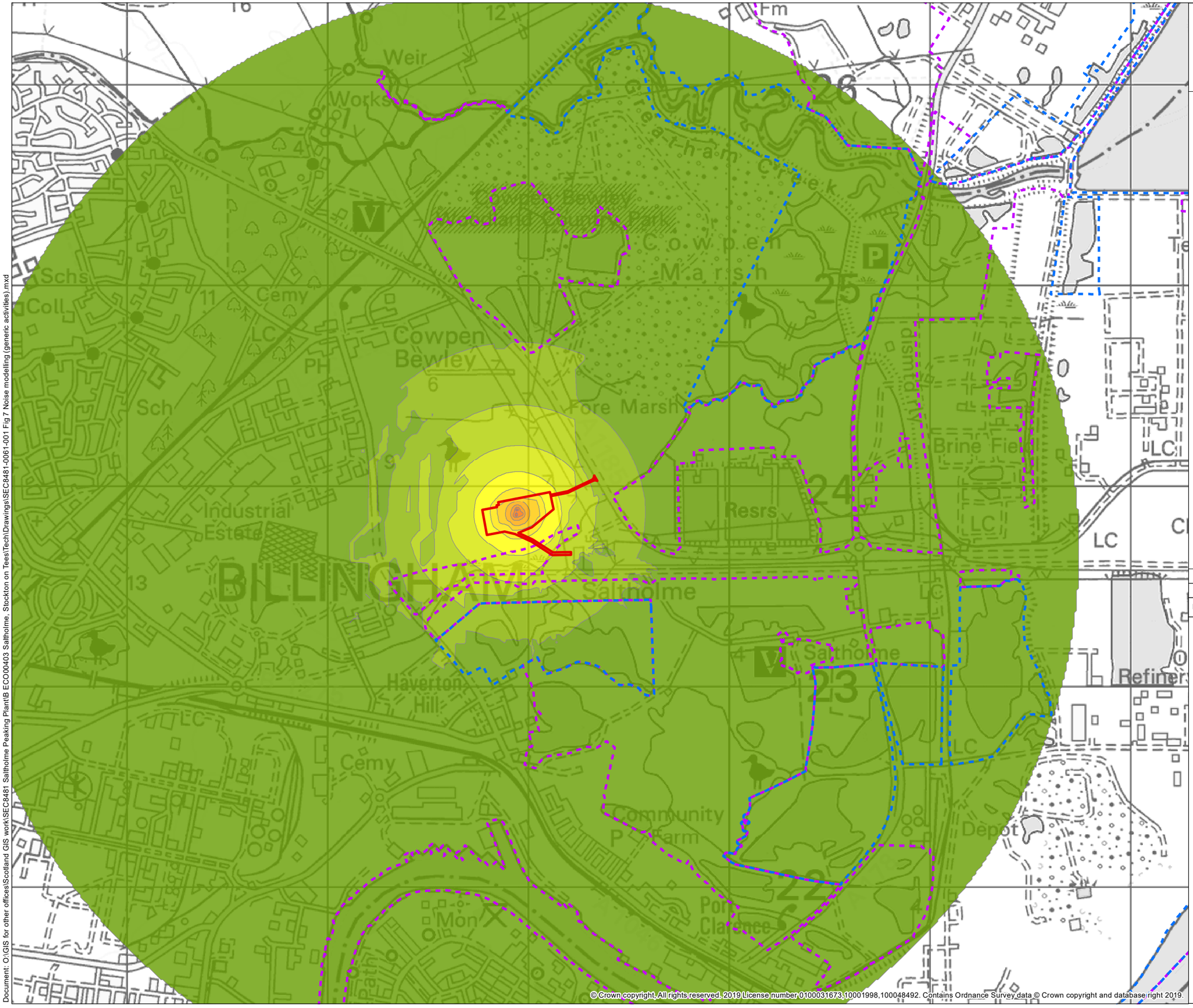

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Site boundary

Special Protection Area

Potential Special Protection Area

Noise (db)

- 21-25
- 26-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56-60
- 61-65
- 66-70
- 71-75

N

0 125 250 500 750 m

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Client: Stratera Energy

Project: Saltholme Peaking Plant

Title: Construction phase noise modelling contours (generic activities)

Status	Drawn By	PM/Checked By
Issue	KM	TG
Project Number	**Scale @ A3**	**Date Created**
SEC8481	1:18,000	28/05/19
Figure Number		**Rev**
8		**01**

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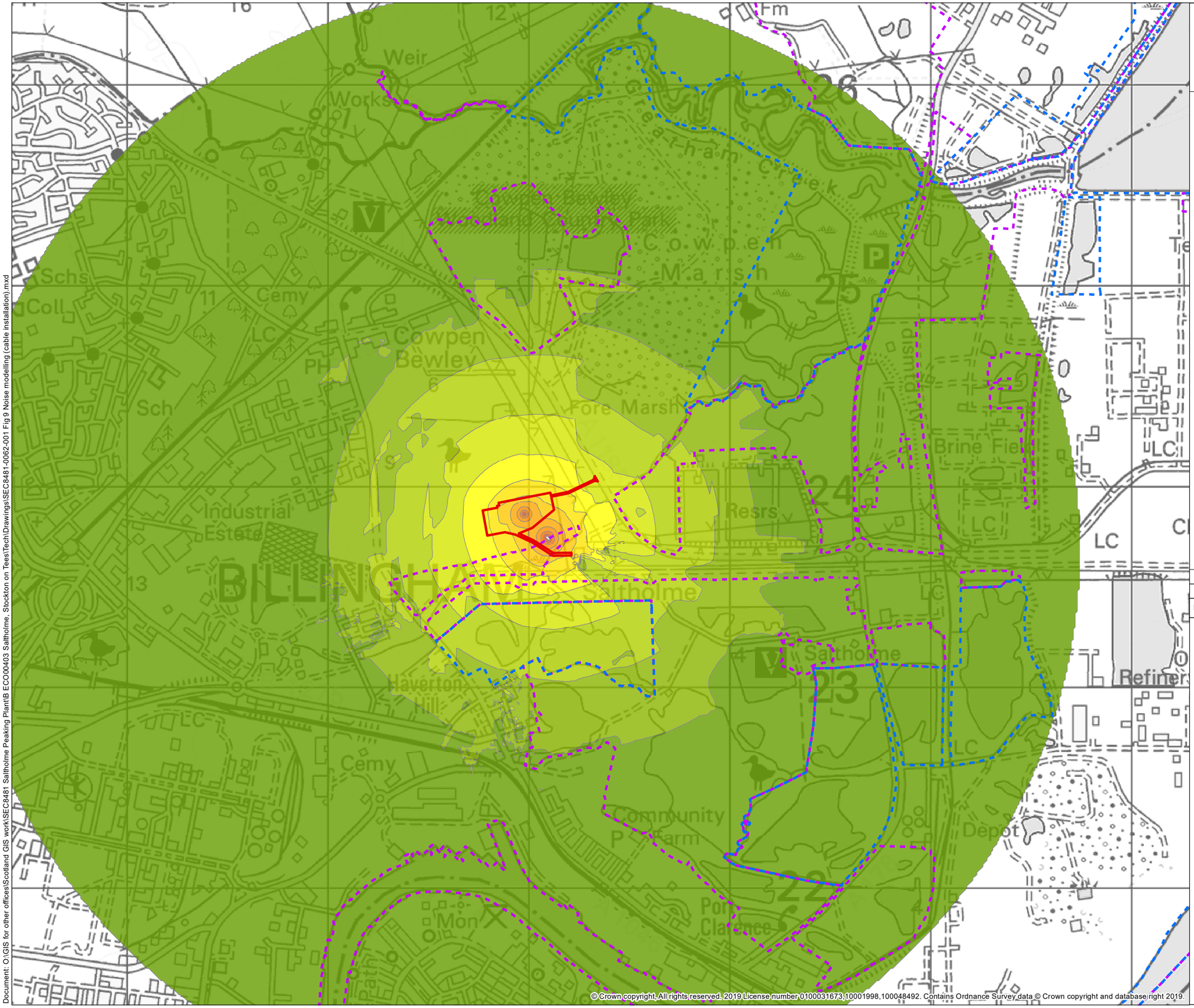
Document: O:\GIS for other offices\Scotland GIS work\SEC8481 Saltholme Peaking Plant\B ECO00403 Saltholme, Stockton on Tees\Tech\Drawings\SEC8481-0061-001 Fig7 Noise modelling (generic activities).mxd



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Site boundary
Special Protection Area
Potential Special Protection Area

Noise (db)
21-25
26-30
31-35
36-40
41-45
46-50
51-55
56-60
61-65
66-70
71-75
76-80

N

0 125 250 500 750 m

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Client: Stratera Energy

Project: Saltholme Peaking Plant

Title: Construction phase noise modelling contours (grid connection cable installation)

Status	Drawn By	PM/Checked By
Issue	KM	TG
Project Number	**Scale @ A3**	**Date Created**
SEC8481	1:18,000	28/05/19
Figure Number		**Rev**
9		**01**

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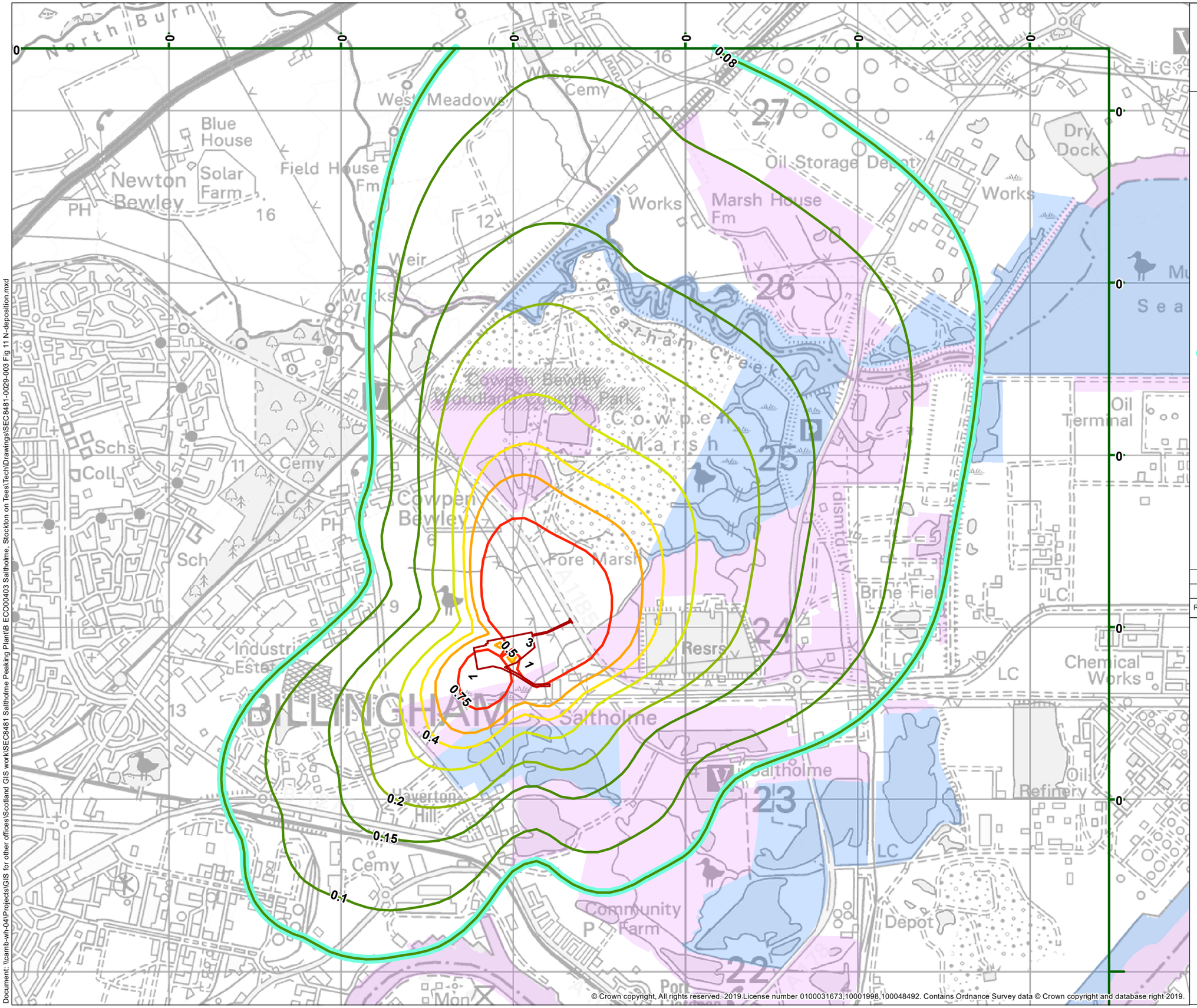
Document: O:\GIS for other offices\Scotland GIS work\SEC8481 Saltholme Peaking Plant\B ECO00403 Saltholme, Stockton on Tees\Tech\Drawings\SEC8481-0062-001 Fig 9 Noise modelling (cable installation).mxd



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Site boundary

Nutrient nitrogen deposition PC (kgN.ha^{-1}.yr^{-1})

- 0.00
- 0.01 - 0.15
- 0.16 - 0.25
- 0.26 - 0.35
- 0.36 - 0.45
- 0.46 - 0.55
- 0.56 - 0.65
- 0.66 - 0.75
- 0.08 = 1% of the critical level for N-deposition
- Special Protection Area
- Potential Special Protection Area

N

0 100 200 400 600 m

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Client: Stratera Energy

Project: Saltholme Peaking Plant

Title: N-deposition modelling contour map

Status	Drawn By	PM/Checked By
Issue	KM	TG
Project Number	**Scale @ A3**	**Date Created**
SEC8481	1:21,000	16/08/19
Figure Number		**Rev**
10		**01**

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Site boundary

Daily-mean NOx PC (µg.m^{-3})

- 0.00
- 0.01 - 10.00
- 10.01 - 20.00
- 20.01 - 40.00
- 40.01 - 60.00
- 60.01 - 80.00
- 80.01 - 100.00
- 100.01 - 130.00
- 7.5 = 10% of the Critical Load for NOx emissions
- Special Protection Area
- Potential Special Protection Area

N

0 100 200 400 600m

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Client: Stratera Energy

Project: Saltholme Peaking Plant

Title: NOx modelling contour mapping

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11		**01**

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Appendix A

Details of Qualifying Interests for Teesmouth and Cleveland Coast SPA/pSPA and Ramsar Site/proposed Ramsar Site

Table A.1 presents the full list of existing and proposed qualifying interests for Teesmouth and Cleveland Coast SPA/pSPA and Ramsar Site/proposed Ramsar Site.

Table A.1: Qualifying Interests of Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/Proposed Ramsar Site

Species	Annex I	Migratory	Assemblage	Ramsar	Time of Year	Population Estimate & %	pSPA Feature Only
Pied avocet (*Recurvirostra avosetta*)	✓		✓		Breeding	18 prs (1.2% GB)	Yes
Little tern (*Sternula albifrons*)	✓		✓	Species of interest	Breeding	40 prs (1.7% GB)	No
Sandwich tern (*Thalasseus sandvicensis*)	✓		✓	✓	Passage	1,900 (6.8% GB)	No
Ruff (*Calidris pugnax*)	✓		✓		Wintering	18 (2.4% GB)	Yes
Common tern (*Sterna hirundo*)	✓		✓		Breeding	399 prs (4.0% GB)	Yes
Red knot (*Calidris canutus islandica*)		✓	✓	✓	Wintering	5,509 (1.6% NE Canada/ Greenland/ Iceland/UK)	No
Common redshank (*Tringa totanus*)		✓	✓	✓	Passage	1,648 (1.1% East Atlantic)	No
Waterbird Assemblage			✓	✓	Wintering	21,312 (SPA) 26,014 (pSPA), 26,768 (pRamsar)	No

Article 4.1 (Annex I) Species Distribution

The Annex I species listed under the existing SPA and Ramsar Site designation are breeding little tern and passage Sandwich terns.

Virtually all breeding little terns associated with the protected site are currently located at Crimdon Dene, north of Hartlepool (13.8km from the proposed project). The feeding grounds of these birds lie predominantly in marine areas within 5km alongshore of the colony and within 3.5km offshore (NE, 2018[1]).

Highest numbers of Sandwich terns occur from mid-July to September when adults and juveniles disperse from breeding colonies. The majority of individuals use roosts at Seal Sands (2.8km from the proposed project), North Gare Sands/Seaton Snook (6.3km from the proposed project), Bran Sands (6.7km from the proposed project) and Coatham Sands (9.6km from the proposed project). They feed in shallow inshore waters in and around the Tees Estuary mouth (NE, 2018[1]).

[1] Natural England (2018) Departmental Brief: Teesmouth and Cleveland Coast Potential Special Protection Area (pSPA) and Ramsar SPA Departmental Brief version 11.2 07/03/18

The Annex I species named under the pSPA and proposed Ramsar Site are breeding avocet and common tern and overwintering ruff.

Pied avocet is not a named feature of the existing Teesmouth and Cleveland Coast SPA or Ramsar as it did not occur in numbers exceeding qualifying thresholds at the time of the original classification. However, the population now represents 1.2% of the British total population, meaning it is a named feature of the pSPA. Avocet does not qualify as a Ramsar feature as it does not meet the 1% biogeographic threshold. The majority of birds breed on Number 4 Brinefield, mainly on the saline lagoon south of Greatham Creek (2.4km from the proposed project) (NE, 2018[1]), with smaller numbers on Greenabella Marsh (2.6km from the proposed project). Some avocet nesting and foraging activity has been recently detected at RSPB's Saltholme reserve (0.5km from the project) (NE, 2018[1], RSPB unpublished data).

The population of ruff makes Teesmouth and Cleveland Coast SPA/pSPA and Ramsar the 7th most important site for the species in the UK. This pSPA also lies to the north of all other sites within the existing suite of SPAs for this species and so extends the range coverage of the species' SPA suite. Ruff occur at shallow waterbodies across the pSPA, in particular on the pools at RSPB Saltholme (0.5km from the proposed project).

The vast majority of breeding common tern in the SPA nest within RSPB Saltholme (0.5km from the proposed project) and undertake some of their foraging on pools within the reserve. This species also breeds on rafts at Cowpen Marsh (1km from the proposed project) (NE, 2018[1]) RSPB unpublished data).

Article 4.2 Regularly Occurring Migratory Species Distribution

The two migratory species for which the existing SPA and Ramsar site is designated, red knot and redshank, are to be retained for inclusion on the pSPA and proposed Ramsar Site.

Red knot feed at low tide on intertidal mudflats, mussel beds and rocky shores on both sides of the Tees Estuary. Formerly present in large numbers in the estuary on Seal Sands (2.8km from the proposed project), particularly when the rising tide covered other foraging habitats, the birds are now increasingly located outside the estuary, on Coatham Sands (9.6km from the proposed project), around Hartlepool Headland (10.3km from the proposed project) and at Redcar Rocks (11.8km from the proposed project) (NE 2018[1]).

Within the site common redshank feed on intertidal mudflats including Seal Sands (2.8km from the proposed project), North Tees Mudflat (4km from the proposed project), Bran Sands (6.7km from the proposed project) and Hartlepool Bay (8.8km from the proposed project), saltmarsh areas at Greatham Creek (1.9km from the proposed project) and intertidal rocky shores at Coatham, Hartlepool Headland and Redcar (located 9.0km, 10.3km and 11.1km away from the proposed project) (NE, 2018[1]).

No additional migratory species are named under the pSPA and proposed Ramsar Site.

Article 4.2 Assemblage Species Distribution

The waterbird assemblage for the existing SPA is designated for supporting at least 21,312 individuals based on data collected over the period 1991/92-1995/96 and includes a wide range of wintering and migratory waterbird species. The existing assemblage includes as its main components, all the Annex I and regularly occurring migratory species which qualify in their own right as well as species whose numbers equal or exceed the national importance threshold (1% or more of Great British population) or are in excess of 2,000 individuals. Table A.2 identifies those species which are identified as main components of the existing SPA along with their estimated populations which are based on data obtained between the late 1980's and late 1990's as well as information on their distribution, where available.

For the pSPA the waterbird assemblage includes as its main components, all the Annex I and regularly occurring migratory species listed above along with a range of main component species which has been revised based on more recent survey data. Over the period 2011/12-2015/16 the Teesmouth and Cleveland Coast SPA/Ramsar site and the proposed extension areas supported an average peak of 26,014 (SPA assemblage) / 26,786 (Ramsar assemblage) individuals. The revised list of main component species for the

pSPA assemblage are also identified in Table A.2 along with their estimated populations and distribution information.

Table A.2: Main Component Species of the Teesmouth and Cleveland Coast SPA/pSPA and Ramsar/ Proposed Ramsar Site Wetland Bird Assemblage

Species	Population Estimate (SPA/pSPA)	Distribution (and proximity to the proposed project) (NE, 2018[1])
Cormorant (*Phalacrocorax carbo*)	140	No distributional information available, but presumably concentrated within coastal and near-shore habitats with smaller numbers occasionally using inland freshwater bodies.
Shelduck (*Tadorna tadorna*)	1,030	Large numbers found on intertidal mudflats of Seal Sands and Bran Sands 2.8km and 6.7km from the proposed project respectively) as well as saltmarshes at Cowpen Marsh and Greatham Creek (1km and 1.5km from the proposed project) and at No.4 Brinefield saline lagoon (~1.5km from the proposed project).
Teal (*Anas crecca*)	1,265	Main concentrations found on brackish and freshwater pools and saltmarsh habitats including at Saltholme (0.5km from the proposed project), North Tees Marshes (a fairly large, loosely defined area located approximately 1km from the proposed project), and Bran Sands (6.7km from the proposed project).
Shoveler (*Anas clypeata*)	129 / 180	Concentrated in various locations around the North Tees Marshes (~1km from the proposed project).
Sanderling (*Caladris alba*)	601 / 243	Predominantly found on the wide sandy beaches at Coatham Sands and Redcar (located 9.0km and 11.1km from the proposed project respectively), with smaller numbers in Hartlepool Bay (located 8.8km from the proposed project).
Eurasian wigeon (*Anas penelope*)	2,660	Predominantly found on the brackish and freshwater pools and adjacent saltmarsh and grasslands around Saltholme (0.5km from the proposed project), Greatham Creek (1.5km from the proposed project) and Seaton Common (4.7km from the proposed project).
Gadwall (*Anas strepera*)	428	Concentrated in various locations around the North Tees Marshes (~1km from the proposed project).
Northern lapwing (*Vanellus vanellus*)	3,892	Large flocks of roosting and foraging lapwing occur at Saltholme (0.5km from the proposed project), Cowpen Marsh (1km from the proposed project), Greatham Creek (1.5km from the proposed project) and Seaton Common (4.7km from the proposed project).
Herring gull (*Larus argentatus*)	3,243	Predominantly found on the intertidal habitats and near-shore waters of Bran Sands, Hartlepool Bay and the open coast north of Hartlepool (located approximately 6.7km, 8.8km and >10km from the proposed project respectively), as well as on the freshwater pools at Saltholme (0.5km from the proposed project).
Black headed-gull (*Chroicocephalus ridibundus*)	2,273	Congregate in large numbers on the intertidal and near-shore waters of Hartlepool Bay (located 8.8km from the proposed project) and on the open coast north of Hartlepool (>10km from the proposed project).

Appendix B

Summary of Original Ornithological Desk Study Data

Wetland Bird Survey (WeBS) Data

WeBS data was obtained for the original sHRA from the British Trust for Ornithology for the nearest available core count sector. This covers the pools, reedbeds and rough grassland of the north western part of the nearby RSPB Saltholme reserve and corresponding part of the Teesmouth and Cleveland Coast SPA/pSPA and Ramsar Site/proposed Ramsar Site. However, it does not include the nearest, recently extended part of the SPA/pSPA and Ramsar Site located between the Saltholme Reserve and the development site including the pools immediately to the north of the reserve (referred to as the Pipeline Pools).

The WeBS data identified that the only named species of the SPA and pSPA which had been recorded in the nearest part of the Saltholme Reserve and hence the SPA were redshank, ruff and common tern. All of these species had been recorded infrequently and in very low numbers. Indeed, the peak counts for redshank and common tern represented less than 1% of their respective SPA/pSPA qualifying populations. Meanwhile, although the peak count for ruff (5 in August) represented more than 1% of the pSPA population (18), this was based on a single count from just one year (i.e. the five year average was 1). Otherwise, the species was very rarely recorded in the nearest part of the Saltholme Reserve and SPA.

The most abundant and frequently occurring birds were wigeon, gadwall, teal and coot, with mallard, shoveler, pochard and tufted duck also occurring regularly in smaller numbers. In terms of wading birds, curlew and lapwing were the most regularly recorded with numbers typically being of no more than 50 individuals, although peak counts of around 100 birds had been recorded infrequently. Similarly, counts of up to 50 black-headed gulls were also regularly recorded but with occasional peaks of between 100 and 200 birds.

Large counts of several hundred Canada geese, and to a lesser extent, greylag geese, were also recorded particularly over the winter months. However, both of these species are understood to be feral/naturalised and so are not considered to be native, wild birds relevant to the SPA/pSPA. All other species were recorded infrequently and/or in low numbers.

The peak counts for the main component species of the SPA/pSPAs overwintering waterbird assemblage and proportion of their respective qualifying populations were: wigeon – 637 (23.9%); gadwall – 142 (33.2%); teal – 183 (14.5%); shoveler - 25 (13.6%); shelduck – 4 (0.4%); lapwing – 110 (2.8%), herring gull – 19 (0.6%), black-headed gull – 199 (8.8%) and cormorant – 9 (6.4%). While all of the wetland bird species recorded the relevant WeBS sector were representative of the SPA/pSPA assemblage, the WeBS data demonstrated that the pools associated with the north western part of the Saltholme Reserve were particularly important for the more abundant and regularly occurring species. This was especially so for those important component species which occurred in numbers greater than 1% of their respective SPA/pSPA qualifying populations.

RSPB Data

RSPB provided details of the breeding locations of breeding SPA/pSPA qualifying species within the Saltholme Reserve. This only included avocet and common terns. It was identified that avocet occupy pools and wet grassland areas in the central and south eastern parts of the reserve over 1km from the nearest part of the proposed development while common terns predominantly use pools in the central part of the reserve over 900m from the proposed development. In addition, an anecdotal record from the former RSPB Saltholme Site Manager was provided of at least 20 ruff associated with the Pipeline Pools.

Data were also provided for the fields associated with the proposed development site (known as the Farming Business Tenancy (FBT) land). The data provided showed that other than one-off moderate to large counts of teal, European white-fronted geese and lapwing, the occurrence of wetland birds was limited to a small

number of species which only occurred infrequently and/or in low abundance. These included curlew, redshank and mallard.

Teesmouth Bird Club Data (TBC)

TBC provided data on the occurrence of wetland birds and other species of conservation concern on and around the fields associated with the development site from the five year period (2013-2017).

The data provided identified that the fields within and surrounding the proposed development site occasionally held various species of feeding geese and swans. The largest numbers provided were for Canada and greylag geese although these were presumably feral/naturalised birds associated with the Saltholme Reserve as reflected in the WeBS data (see above). Small flocks of pink-footed geese comprising no more than 20 individuals, had occasionally been recorded in 2015 and 2017, while up to 127 European white-fronted geese had also regularly been recorded January and February 2017, although numbers were typically less than 65. Very small numbers of barnacle, bean (Taiga and Tundra sub-species) and snow geese and whooper swans had also been recorded. The data also identified that curlew and lapwing regularly utilise the area for feeding with the latter sometimes breeding in the wetter areas. Snipe were also known to breed in the wetter areas associated with the fields.

Appendix C

Sensitivity of SPA/pSPA Habitats and Species to Changes in Nutrient N Deposition and NOx Emissions

TABLE C1: SENSITIVITY OF pSPA QUALIFYING SPECIES TO IMPACTS ON ASSOCIATED HABITATS FROM N DEPOSITION

SPA*/pSPA Qualifying Species	Associated broad habitat type(s)	Habitat sensitive to N deposition	Species sensitive to attributable habitat effects	Reason
Little tern*	Dunes/dune grassland	Yes	Yes	Succession of prostrate plants by tall grasses, increased N leaching, soil acidification, loss of typical lichen species, although potential positive impact on species' food supply.
Sandwich tern*	Dunes/dune grassland	Yes	Yes	Succession of prostrate plants by tall grasses, increased N leaching, soil acidification, loss of typical lichen species.
Avocet	Coastal sediments and saltmarsh	Yes	Yes	Succession by grasses, although potential positive impact on species' food supply.
Common tern	Dunes/dune grassland and open water	Yes	Yes	Succession of prostrate plants by tall grasses, increased N leaching, soil acidification, loss of typical lichen species, although potential positive impact on species' food supply.
Ruff	Grassland and saltmarsh	Yes	No	No negative impact expected.
Red knot*	Coastal sediments and saltmarsh	Yes	No	No negative impacts expected although potential positive impact on species' food supply.
Redshank*	Coastal sediment and saltmarsh	Yes	No	No negative impacts expected although potential positive impact on species' food supply.

TABLE C2: SENSITIVITY OF BROAD HABITATS USED BY THE WIDER pSPA WETLAND BIRD ASSEMBLAGE TO N DEPOSITION

Broad SPA habitat type(s)	Habitat sensitive to N deposition	Details	Likelihood and rationale to adverse effects on associated species.
Dunes/dune grassland	Yes	Succession of prostrate plants by tall grasses, increased N leaching, soil acidification, loss of typical lichen species, although potential positive impact on species' food supply.	Potential for tern breeding sites to become colonised by late successional plants/grasses.
Coastal sediment/ mudflats	No	Intertidal habitats are regularly flushed by the tide from which N inputs are likely to outweigh airborne contributions.	Negligible-none.
Saltmarsh	Yes	Although saltmarsh communities are typically N-deficient, they are regularly	Negligible – riverine and tidal inputs are likely to outweigh

Broad SPA habitat type(s)	Habitat sensitive to N deposition	Details	Likelihood and rationale to adverse effects on associated species.
		flushed by nutrient-loaded riverine and tidal waters.	airborne N-deposition contributions.
Grassland (including grazing marsh)	Yes	Increase in late successional species and dominance of graminoids/grasses, and reduced species diversity.	Negligible – terrestrial inputs (including fertiliser, and waterfowl and livestock dung) are likely to outweigh airborne N-deposition contributions. At Saltholme, the effects are also countered by livestock grazing.
Open water	Yes	Change in the species composition of macrophyte communities, increased algal productivity and a shift in nutrient limitation of phytoplankton from N to P.	Negligible – terrestrial and riverine inputs are likely to outweigh airborne N-deposition contributions.

TABLE C3: SENSITIVITY OF SPA/pSPA QUALIFYING SPECIES TO IMPACTS ON ASSOCIATED HABITATS FROM NOx DEPOSITION

SPA*/pSPA Qualifying Species	Associated broad habitat type(s)	Habitat sensitive to NOx deposition	Species sensitive to attributable habitat effects	Reason
Little tern*	Dunes/dune grassland	Yes#	Yes#	Changes in species composition.
Sandwich tern*	Dunes/dune grassland	Yes#	Yes#	Changes in species composition, although potential positive impact on species' food supply.
Avocet	Coastal sediments and saltmarsh	Yes	No	No negative impact expected.
Common tern	Dunes/dune grassland and open water	Yes#	Yes#	Changes in species composition, although potential positive impact on species' food supply.
Ruff	Grassland and saltmarsh	Yes	No	No negative impact expected.
Red knot*	Coastal sediments and saltmarsh	Yes	No	No negative impacts expected although potential positive impact on species' food supply.
Redshank*	Coastal sediments and saltmarsh	Yes	No	No negative impacts expected although potential positive impact on species' food supply.

Habitat/species only vulnerable to NOx deposition if close to busy road or combustion source.

TABLE C4: SENSITIVITY OF BROAD HABITATS USED BY THE WIDER SPA/pSPA WETLAND BIRD ASSEMBLAGE TO NOx EMISSIONS

Broad SPA habitat type(s)	Habitat sensitive to N deposition	Details	Likelihood and rationale to adverse effects on associated species.
Coastal habitats	Yes#	Changes in species composition.	Potential for tern breeding sites to become colonised by late successional plants.
Wetlands	Yes#	Changes in species composition.	Negligible – terrestrial inputs (including fertiliser, and waterfowl and livestock dung) are likely to outweigh airborne N contributions.
Grassland	Yes#	Changes in species composition.	Negligible – terrestrial inputs (including fertiliser, and waterfowl and livestock dung) are likely to outweigh airborne N contributions.
Open water	Yes#	Changes in species composition.	Negligible – terrestrial and riverine inputs are likely to outweigh airborne N contributions.

[#] Habitat/species only vulnerable to NOx deposition if close to busy road or combustion source.