



Scotland England Green Link 2 - English Onshore Scheme

Environmental Statement:
Volume 3

Appendix 13D: Operational Noise Modelling

May 2022

For: National Grid Electricity Transmission

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Appendix 13D Operational Noise Modelling

Operational noise from the converter station has been modelled and assessed. The noise source details of the proposed plant for the converter station for the purpose of the operational noise modelling and assessment are presented in Figure 13D-1 and Table 13D-1.

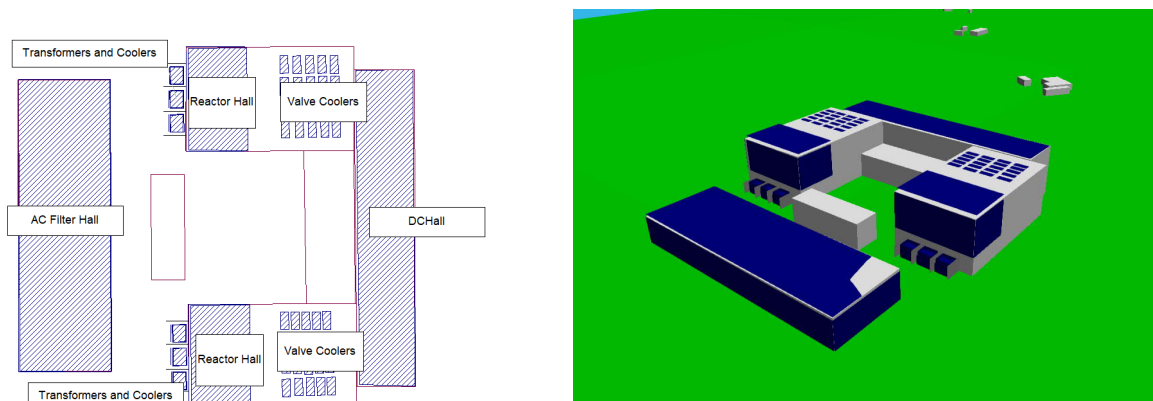


Figure 13D-1: Converter Station

Table 13D-1: Operation Noise Sources

| Name | Type | 31 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | dBA |
|----------------------|----------------|----|-----|-----|-----|-----|----|----|----|----|-------|
| Transformer | L _w | 89 | 89 | 106 | 103 | 102 | 84 | 79 | 83 | 75 | 100.8 |
| Transformer fan | L _w | 94 | 111 | 107 | 104 | 104 | 99 | 97 | 87 | 77 | 105.1 |
| Valve Cooling Unit | L _w | 78 | 96 | 91 | 88 | 88 | 84 | 81 | 72 | 62 | 89.4 |
| AC - DC filter Halls | Li | 0 | 66 | 73 | 75 | 70 | 64 | 59 | 54 | 47 | 71.3 |
| Reactor Hall | Li | 40 | 77 | 83 | 85 | 80 | 74 | 69 | 64 | 57 | 81.3 |

AC Hall – DC Hall and Reactor Hall of converter station consists of noise sources inside the buildings. To represent the continuous noise source characteristics of operational equipment, area sources modelled around the buildings and sound reduction due to façade elements are considered. The filter area, valve coolers and transformers are modelled as outdoor equipment. Valve cooler units are located at the ceiling level of the converter hall building. Concrete walls (blast walls) are placed in between outdoor transformers.

The façade of the buildings is considered as composite panels. The sound reduction index of the façade composite panel is shown in Table 13D-5.

Table 13D-2: Composite Panel Sound Reduction

| Sound Redcution Index (SRI) Octave Band Centre Frequencies (Hz) | | | | | | | | | | |
|---|----|-----|-----|-----|----|----|----|----|----------------|--|
| 31.5 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | R _w | |
| 5 | 11 | 14 | 19 | 23 | 23 | 23 | 39 | 50 | 24 (-1:-3) | |

Noise mitigation measures are applied to outdoor transformer units, transformer coolers and valve cooling units. The mitigated octave band sound power levels of the equipment are presented in Table 13D-3.

Table 13D-3: Sound Power Levels After Mitigation

| Plant | Type | Octave Band Centre Frequencies (Hz) | | | | | | | | | dBA |
|--------------------|----------------|-------------------------------------|----|-----|-----|-----|----|----|----|----|------|
| | | 31 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Transformer | L _w | 74 | 74 | 91 | 88 | 87 | 69 | 64 | 68 | 60 | 85.8 |
| Transformer fan | L _w | 79 | 96 | 92 | 89 | 89 | 84 | 82 | 72 | 62 | 90.1 |
| Valve Cooling Unit | L _w | 64 | 82 | 77 | 74 | 74 | 70 | 67 | 58 | 48 | 75.4 |

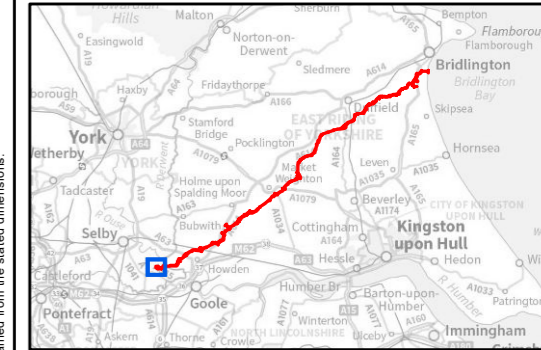
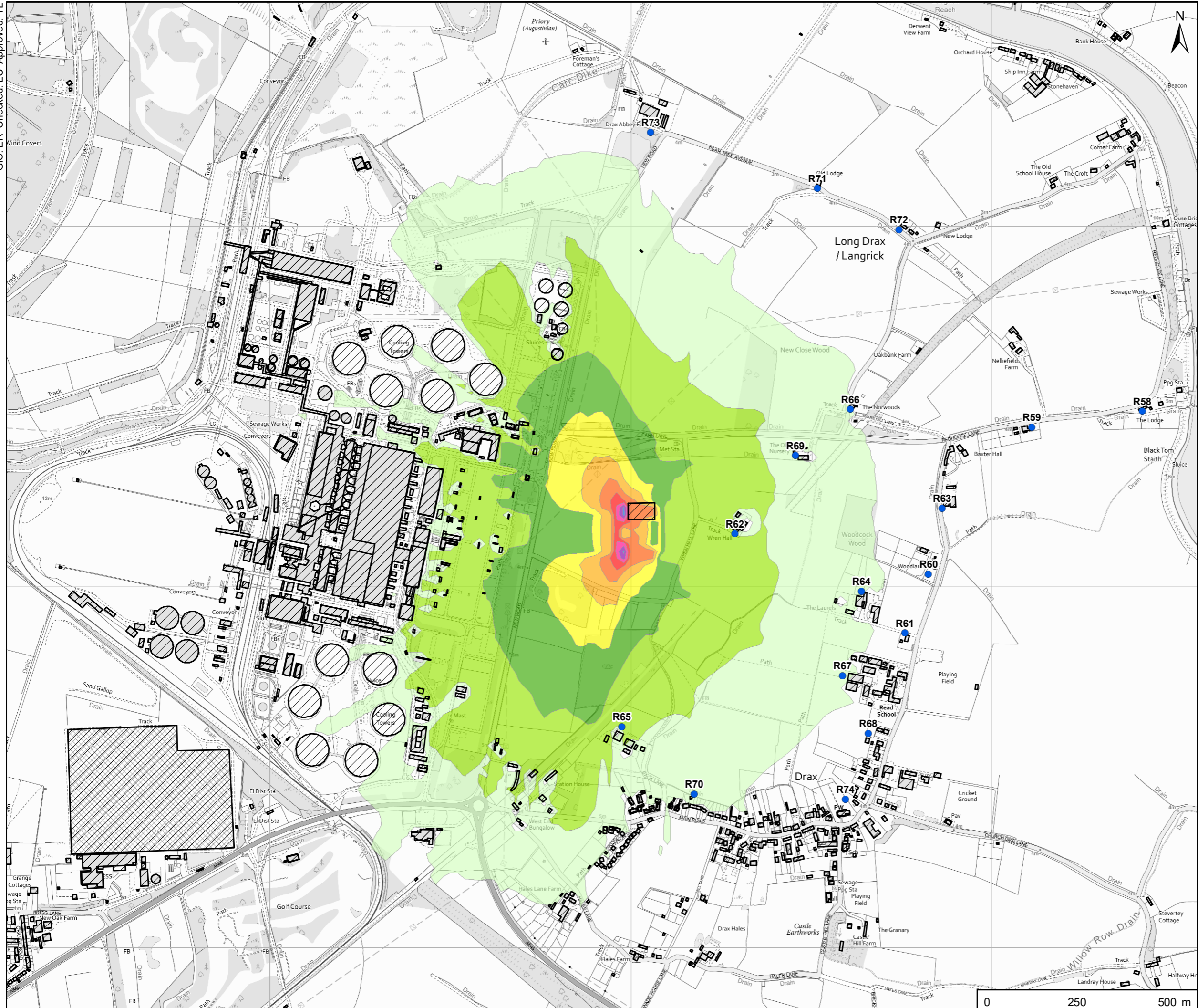
The unmitigated and mitigated noise modelling results for the operation phase of the project are presented in Table 13D-4 for the day and night-time periods. The operational noise contours are presented in Figure 13D-1.

Table 13D-4: Predicted Operational Noise Levels

| Receivers ID | Unmitigated | | Mitigated | |
|-----------------|------------------|--------------------|------------------|--------------------|
| | L _{day} | L _{night} | L _{day} | L _{night} |
| Rec58 | 23.1 | 23.4 | 11.8 | 12.4 |
| Rec59 | 21 | 24.4 | 9.1 | 12.9 |
| Rec60 | 29.6 | 29.9 | 17.9 | 18.7 |
| Rec61 | 29.9 | 30.2 | 18.1 | 19 |
| Rec62 | 37.8 | 38.5 | 25.5 | 26.2 |
| Rec63 | 29.2 | 29.4 | 17.3 | 17.9 |
| Rec64 | 32.1 | 32.4 | 20.3 | 21.1 |
| Rec65 | 38.8 | 39.2 | 25.7 | 26.7 |
| Rec66 | 31.6 | 31.9 | 19.8 | 20.6 |
| Rec67 | 31.3 | 31.6 | 19.6 | 20.4 |
| Rec68 | 29.1 | 29.4 | 17.6 | 18.4 |
| Rec69 | 35.1 | 35.4 | 23.1 | 23.9 |
| Rec70 | 32.6 | 33.1 | 20 | 20.9 |
| Rec71 | 26.7 | 27.1 | 15.3 | 16.2 |
| Rec72 | 26.2 | 26.5 | 14.9 | 15.7 |
| Rec73 | 29.7 | 30 | 16.6 | 17.4 |

PROJECT
Scotland England Green Link 2

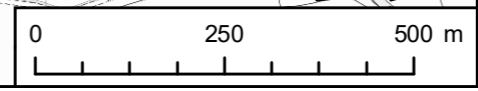
- KEY**
- Noise Receptor Location
 - ▨ Building Location
 - Operational Noise Contour
 - Lday (dBA)
 - 20 - 25
 - 25 - 30
 - 30 - 35
 - 35 - 40
 - 40 - 45
 - 45 - 50
 - 50 - 55
 - 55 - 60
 - 60 - 65
 - 65 - 70



TITLE
Appendix Figure 13-7
Operational Noise Map
Lday h = 1.5 m
Grid Size 20 x 20 m

REFERENCE
SEGL2_T_ESA_13-7_v1_20220530

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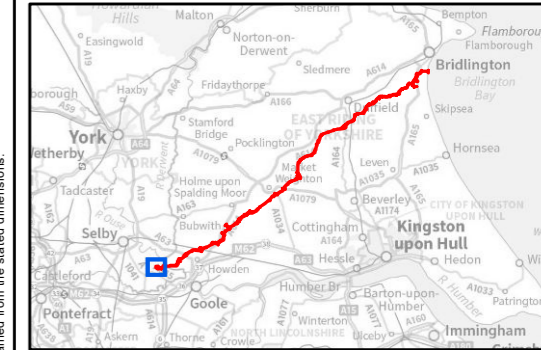
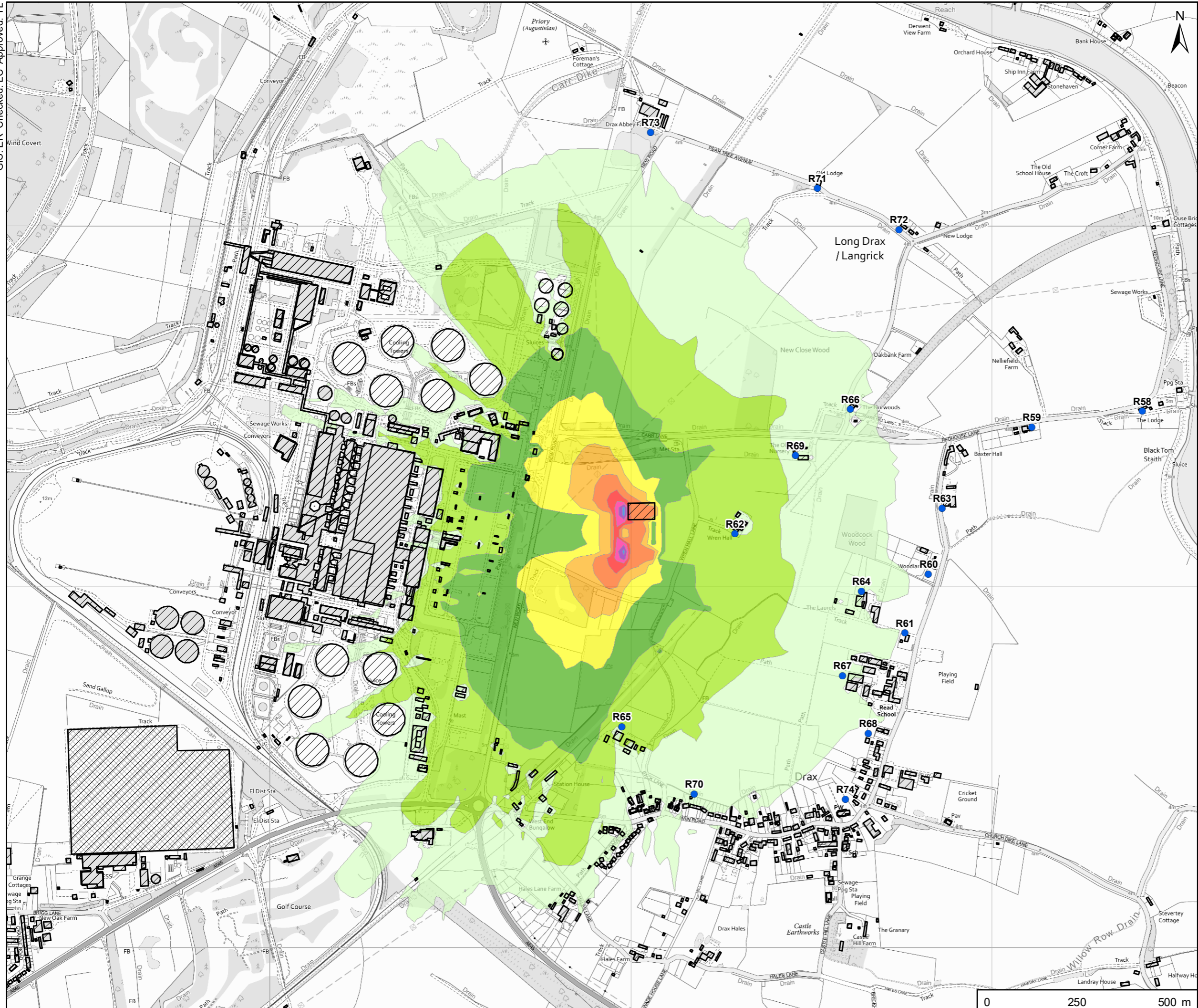


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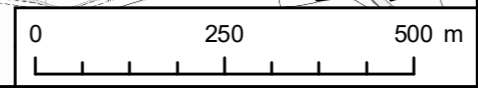
- KEY**
- Noise Receptor Location
 - ▨ Building Location
- Operational Noise Contour**
- Lnight (dBA)**
- 20 - 25
 - 25 - 30
 - 30 - 35
 - 35 - 40
 - 40 - 45
 - 45 - 50
 - 50 - 55
 - 55 - 60
 - 60 - 65
 - 65 - 70



TITLE
Appendix Figure 13-8
Operational Noise Map
Lnight h = 4 m
Grid Size 20 x 20 m

REFERENCE
SEGL2_T_ESA_13-8_v1_20220530

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